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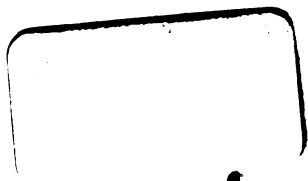
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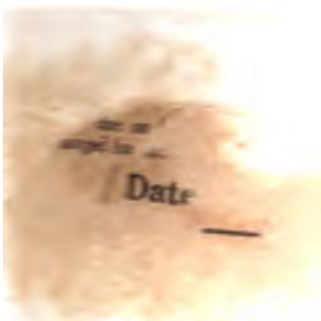


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A Doctor's Viewpoint

By

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TABLE OF CONTENTS

A Twentieth Century Epic.....	9
The Elimination of Tuberculosis.....	32
Danger Signals	41
The Prevention of Cancer	51
Don't Be a Hermit Crab.....	59
The Cowardice of Brave Men.....	67
Woman's Seven Ages	76
Let Us Go Out Into the Sunshine.....	91
Sense Training	98
Eugenics	103
Medical Research and Education	110
Editorial Effusions	124
How Genius Manifests Itself.....	124
The Humanness of Scientists	125
Pulicide	128
Unscientific Futilities	131
Cupid in Psychology	133
Social Excitements	134
Psychic Research	138
Factors of Safety	140
Killing and Conservation	142
The Ethnics of Infection	144
Consumption and Civilization	147
Mongrelized Races	151
An Anti-Vivisection Play	153
Spugs and Spefs	156
Euthanasia	157
The Philosophy of Prayer.....	160

To
L. M. H.
Would it were worthier!

PREFATORY NOTE

A short preface; since nobody ever reads a long one. Much of our interest in life lies in how we appreciate one another's ways of looking at it—the way of the counsellor, the sky-pilot, the painter, the farmer, the policeman on the fixed post, the steeplejack, the man on the street, the woman in the wrapper. If this book gets carried in anybody's coat pocket, or secures place under the evening lamp and besides the armchair it will be because it has been written from a doctor's viewpoint of our human relations and of our civilization.

Some of the matter in the following pages has appeared in *The American Review of Reviews*, *Collier's Weekly*, *Harper's Weekly*, *The New York Evening Post*, *Outdoor Life and Recreation*, *Knowledge*, *Scientific American*, *Lippincott's Magazine*, *The British Journal of Tuberculosis* and other Journals. To the editors of these publications I make my grateful acknowledgments.

A TWENTIETH CENTURY EPIC

Venerable folk can to-day recall how in their childhood the medieval conception of disease still persisted—that the forces evolving pestilence were mightier than man could hope to struggle with, too awful to be defied; the only escape for humankind lay in propitiating, if possible, those supernatural powers. Hosts must succumb when the angel of death spread his wings on the blast, a cloud passed over a doomed city and from it a retributive hand scattered upon an evil generation the seeds of destruction.

Such images permeated literature and made it magnificent. The poetic temperament may a little regret the extent to which the modern science of preventive medicine has damaged imaginative literature, so that such sublime pictures as Milton portrayed, such superb visions as Byron and Coleridge saw, cannot now get themselves expressed; and (since human interest depends largely on the extent to which events imagined may conceivably enter into human experience) would be little appreciated if they were published. We could not to-day enjoy, in quite the same way, another "Masque of the Red Death," in which the bubonic plague was personified; nor another such work as "The Wandering Jew," who personified the cholera that stalked spectre-like through three continents.

The modern idea of warfare against disease was expressed by Pasteur: "It is within human power to banish all parasitic (infectious) diseases from the face

of the earth." Here surely is a more reverent conception than that medieval one; for it does not hold diseases to be scourges inflicted by a cruel deity. And it is a juster conception, for it holds most pestilence to be practically man-made; wherefore, and by the same token, such pestilences are man-preventable. And we are concluding that man, not God, fixes the death rate. Here, as elsewhere in life, it is for man to work out his own salvation. Nor does the modern Prometheus defy divinity; but seeks, how successfully we shall see, by the exercise of his God-given faculties, to free his race of aeon-long sufferings and disasters. Morse's first telegram read: "What hath God wrought." We are now to consider what God hath wrought *through human agency*.

PREVENTIVE MEDICINE

Our modern epic begins, then, with the birth of preventive medicine, now the most pervasively benignant force in civilization. Pasteur was the accoucheur when he demonstrated microscopic parasites (germs, bacteria, bacilli) to be the essential causes of the infections; each infection having its specific and invariable germ. And let us premise here that, in science at least, great names are landmarks; and the owners of these names have traversed and gleaned in fields where many a devoted and forgotten laborer had delved and sown and pathetically sweated blood in his altruistic zeal. In science at least no man works in vain. Full many an one, worthy of an elegy, has given his whole life to establishing a fact or indeed only an item to a fact; his work unrealized, ridicule and even persecution oftentimes his only compensation, throughout perhaps in the meanest destitution; yet his life and his work have been absolutely essential to the building of a mighty

fabric. Martyrs have been many among such, dying of the diseases from which they sought to defend others; knowing too, full well, what their own fate would be. Nor does it in any wise detract from the gratitude due the great man, that he has profited by the labors of others, adding what he can of his own, scrutinizing every detail, every datum, permeating and illuminating all with his own genius, cementing the mass with his own deductions. Thus did Jenner's inoculations, for example, make clear the way for Davaine and Lister, Tyndall and Pasteur.

Upon the foundation then, thus laid by Pasteur, did Koch and his co-workers bring to maturity the science of preventive medicine. And what phase of human existence does it not to-day influence? Personal, domestic, school, communal hygiene, as we now understand these terms, are derived from it. Infants no longer die by dispensations of Providence, but by germ-laden milk. Preventive medicine has become adequately equipped to deal with housing, sewage, filtration—well-nigh all problems of rural, civic, State, national, international, world sanitation. Vast tracts of hitherto pestilent land, formerly impossible of human habitation, are now made salubrious and capable of most profitable agriculture. Only Oriental fatalism stands in the way of eliminating those age-long plagues, which are still nurtured in the bosom of Old Mother India, and go forth on their ghastly business from that dreadful progenitor. But now with ever-decreasing frequency and virulence; for Ross, Manson, Haffkine, and Shiga and their confreres have been and are making tremendous progress in their titanic work against those infections. Africa's most dreadful infection, the sleeping sickness, is also being mastered, largely through the

work of Koch, Ehrlich, and their colleagues. Malaria, that tyrant which only a score of years ago dominated half the world, is now suffered only by the supine.

Tuberculosis, which since the beginning of the race has been the Captain of the Men of Death, can also, if we but will, be eliminated from human experience. In commerce, more than in any other phase of civilization, has advantage been taken of the benefits preventive medicine can bestow: such infections as yellow fever, smallpox, malaria, typhoid and the dysenteries have been abolished from many entrepôts: business indeed, because it has been found to pay, has succeeded not infrequently, where discouraged humanity has failed.

And the wisest statesmanship is now comprehending that through preventive medicine disease can be abolished, life prolonged, and existence made happier. How sanely has Lecky observed: "The great work of sanitary reform has been perhaps the noblest legislative achievement of our age, and, if measured by the suffering it has diminished, has probably done more for the real happiness of mankind than all the many questions that make and unmake ministries." And Dr. Eliot, of Harvard, is insisting that no religion is worthy the name which does not take to its grateful embrace preventive medicine.

A MOST SALUTARY INVASION

As early as 1847 the idea existed that mosquitoes have somehow to do with the spread of yellow fever. In 1881 Dr. Carlos F. Finlay, of Havana, definitely set forth the theory, which he tried to prove but could not because he used in his inoculation experiments mosquitoes that had bitten yellow fever patients only within five days; whereas it was later demonstrated that the

mosquito is harmless until twelve days or longer after the biting.

When our army occupied Cuba, in 1898, Yellow Jack had been epidemic, indeed practically endemic (that is, constant) in Havana; and despite all the then-known methods of fighting that infection there were about 1,500 cases and 231 deaths among American officers and men in the year 1900. Dr. George M. Sternberg, Surgeon-General of the United States Army, appointed four surgeons who were then on duty in Cuba, Walter Reed, James Carroll, Jesse W. Lazear, and Aristides Agramonte, a board to test the theory of mosquito transmission. Realizing that human life must be put in jeopardy, these men were unwilling to assume the responsibility of asking others to risk death; and they agreed to make the first experiments upon themselves. (This was, by the way, after Dr. John Guiteras, of Havana, began in February, 1891, a series of tests to ascertain whether yellow fever could be propagated in a controllable form by means of infected mosquitoes, thus securing immunization, as is done by vaccination in smallpox. He infected eight volunteers with mosquitoes, three of whom died, including an American nurse—(Miss Clara D. Maas, of Orange, N. J.). Before the mosquitoes were ready for the tests Reed was ordered to Washington on official duty and was prevented from taking part in the experiments; and quite rightly he did not afterward subject himself to them. Agramonte was an immune. Carroll was first bitten and suffered a very severe attack of yellow fever, from which he recovered, though for a long time his life was despaired of. And his premature death was certainly hastened by this experience. Next Lazear, while in a yellow-fever hospital, collecting blood from the patients for study, saw

a mosquito settling on the back of his hand. Like the ancient Roman who thrust his hand in the devouring flame, he calmly let the insect remain there till it had satisfied its hunger and had injected the lethal poison. Lethal? Yes, for five days later this hero of the ages came down with yellow fever and died of it.

HEROIC VOLUNTEERS IN THE WAR AGAINST DISEASE

To establish the length of the period when an infected mosquito became harmful after its biting of a yellow-fever sufferer, and also the time which must elapse after the patient had been stricken before the disease can be conveyed to the mosquito for transmission, Dr. Reed instituted a second series of experiments in "Lazear Camp" near Quemados, Cuba. General Leonard Wood, then military governor of Cuba, gave all possible assistance, and to encourage volunteers for the tests offered a reward of two hundred dollars. And, though his call was issued after Lazear's martyrdom and when the army realized full well in what manner he and Carroll had suffered, "to the everlasting glory of the American soldier, volunteers from the army offered themselves for experiment in plenty and with the utmost fearlessness."

The first to present themselves were two young Ohio soldiers, John R. Kissinger and John J. Moran; but only on the condition that they should receive no pecuniary reward. Kissinger on three successive occasions was taken, clad only in a nightshirt, into a room where infected mosquitoes were confined and lay there quietly until they bit him; and he was infected with the fever, from which he recovered. Moran, similarly clad, entered the room containing the mosquitoes, where he lay for thirty minutes. Within two minutes from his

entrance he was being bitten about the face and hands. On Christmas morning he was also stricken with yellow fever, and, like Kissinger, fortunately recovered. There were in all twenty-two, thirteen of them American soldiers, who submitted gloriously to the tests.

Into the tests to demonstrate that yellow fever was not conveyed through fomites (contact infection through inanimate objects, contagion) seven persons entered—Dr. Robert P. Cooke, an acting assistant surgeon of the army and six privates of the hospital corps. In a single room, fourteen by twenty feet, carefully guarded against the entrance of mosquitoes, its temperature maintained at about seventy-six degrees, with a sufficient amount of humidity, supplied with a large quantity of bed clothing and wearing apparel, taken from the beds and persons of patients who died of yellow fever, Dr. Cooke and his men slept for twenty consecutive nights, handling and wearing the contaminated clothing, “although the stench was almost unbearable.” They came out of the ordeal in perfect health, proving beyond the possibility of dispute that the disease was not contagious and that the mosquito is the sole method of transmission.

“YELLOW JACK” VANQUISHED

By such heroisms was it demonstrated that: The mosquito known as *stegomyia*, and only that insect, serves as the intermediate host for the parasite of yellow fever; this disease is transmitted to the non-immune individual by means of the bite of *stegomyia* that has previously fed on the blood of one sick of this disease; an interval of twelve days or more after contamination is necessary before *stegomyia* can convey the infection; the period of incubation (from the bite to the appear-

ance of symptoms) in yellow fever varies from forty-one hours to six days; yellow fever is not conveyed by fomites, wherefore disinfection of articles of clothing, bedding, or merchandise, supposedly contaminated by contact with those sick of this disease, is unnecessary. A house is infected with yellow fever only when there are present within its walls contaminated *stegomyia* capable of conveying the parasite of this disease; and while the mode of propagation of yellow fever has now been definitely determined its specific cause, like the specific cause of smallpox, remains to be demonstrated.

In February of 1901, by order of General Wood, Surgeon-Major William Crawford Gorgas, then chief sanitary officer of the city, proceeded to eliminate yellow fever from human experience in Havana; and this he did within a year, although in at least one hundred and fifty years that city had never been free of Yellow Jack. He screened cases of yellow fever, and all suspected cases; destroyed infected insects; and suppressed *stegomyia* through control of their breeding places. Later he turned the same trick in Panama, whilst White banished yellow fever from New Orleans in 1905, Liceaga from Vera Cruz, and Oswaldo Cruz from Rio de Janeiro in 1909.

PANAMA BEFORE 1900

Properly to appreciate what Gorgas and his associates in preventive medicine have done in the Canal Zone one must consider what Panamanian conditions were before the twentieth century. It was one of Keats' finest inspirations—surprised Balboa viewing the Pacific from a peak in Darien. Balboa is said to have contemplated a waterway connecting the two vast oceans; and his Spanish sovereign is historied to have

entertained the scheme, proposed in 1520 by one Angel Saavadra. A decade later Balboa's father-in-law, Pedro d'Avila, founded Panama, which some now claim to be the oldest American city; not quite correctly, it seems, for d'Avila's stronghold was several miles from the present site. In the seventeenth and eighteenth centuries Panama was Spain's gateway, through which passed most of the gold and silver after Pizarro's conquest of the Incas; to which were added also pearls from the Islands, gold from Darien and the coast of Central America and from Mexico. Panama in those days rivaled the mother country in her splendors. It was a life of almost Asiatic luxury. We shall have a word to say of speculation under the French occupation, but the spirit of "graft" was considerably pervasive in that olden time. For instance, the walls of that key to the Pacific, of that "gateway to the universe" alone cost over \$11,000,000; and that at a time when labor, mostly by enslaved Indians, was indeed dirt cheap. Philip II is said to have gazed westward from his palace window, shielding his eyes and observing that he was looking for the walls of Panama; for "they have cost enough to be seen even from here."

Well, Morgan and his buccaneers and freebooters found Panama too rich a prize to disregard; and they did for d'Avila's settlement in 1671. Those were the days of which Robert Louis and James Pyle have so uncannily told; when Yellow Jack was the undertaker-in-chief and Davy Jones' locker the graveyard; when

"Ten men sat on a dead man's chest,
Ho, ho, ho and a bottle of rum!"

Old Morgan did the job so well that no vestige of

Panama was left; its site until the French occupation was overgrown by a dense and most pestilent tropical forest. Up to the American occupation this neck of land binding together two continents has been made up of mountains and the valleys between them; dense, almost impenetrable undergrowth, making a veritable jungle; independent and conjoined bodies of stagnant waters; swamp areas; bottomless quagmires, with torrential river streams draining in the persistent rainy seasons the mountain watersheds and deluging the lowlands on their way to the Pacific and the Mexican Gulf. Humboldt, a century ago, after a visit to the Isthmus in which he studied the conditions, gave his belief that Panama must always be cursed by yellow fever and malaria; the former he understood to be caused by the decaying mollusks and marine plants on the beach at low tide, the latter by foul emanations from over-rank vegetation; then came the French headed by the grandiose De Lesseps, who squandered from 1881 to 1892 an equivalent of more than one dollar for every minute of time that has elapsed since Balboa first, in 1513, set foot on that wonderful and gruesomely fascinating Isthmus.

A reason why Panama has been peculiarly pestilent is that, since Balboa, the Isthmus has been the point of crossing between the two oceans in the western hemisphere; wherefore there have always been at Panama many unacclimated Europeans, who were easy victims to the tropical infections. Gorgas believes that on the average, through four hundred years past, there have been more unacclimated Europeans in Panama than in any other tropical city liable to yellow fever. Wherefore this region had acquired the reputation of being the unhealthiest known.

Froude, who visited the West Indies in 1885, wrote: "In all the world there is not, perhaps, now concentrated in any single spot so much swindling and villainy, so much foul disease, such a hideous dung heap of moral and physical abomination, as in the scene of this far-famed undertaking of nineteenth century engineering. . . . The scene of operations is a damp, tropical jungle, intensely hot, wet, feverish, swarming with mosquitoes, snakes, alligators, scorpions, and centipedes, the home, even as nature made it, of yellow fever, typhus, and dysentery; and now made immeasurably more deadly by the multitudes of people who crowd thither."

Except to note that De Lesseps spent \$260,000,000 and had, for all that, done but a fraction of the work, we can touch here only on the medical aspects of that Gallic debacle; the suffering and dying were a veritable replica of the Black Death of the Middle Ages. Behind everything lurked always the grim spectre. "Eat, drink and be merry for to-morrow you die" was everywhere the ghastly sentiment, either subconsciously felt or openly expressed. The strongest to-day would be among the buried to-morrow. Yellow Jack claimed two out of four, perhaps two of every three victims among those Frenchmen; and how brave they were, how reckless of death! An instance among many: Claude Mallet, the then consul at Panama, accompanied a surveying party of twenty-two to the Upper Chagres. Within a week all but Mallet and a Russian engineer, Dziembowski were incapacitated by disease. This Russian asked Mallet to advance him money, against next pay day, for a new suit of clothes. On the afternoon of their return the clothing was bought; and Dziembowski accepted Mallet's invitation to lunch the next day. But

the guest did not come—having died of yellow fever at three that morning and having been buried about daylight in those clothes.

Jules Dingler, the first director-general of the canal work, had erected for him a \$150,000 residence; "La Folie Dingler," it was called, because of its excessive cost and its rather inaccessible location, high on the southern slope of Ancon Hill. Before Dingler could occupy his house his wife, son, and daughter died of yellow fever; and he returned to France soon after, himself to die, a broken-hearted man. Leon Boyer succeeded him and had hardly begun his duties when he also was smitten and died. "The mysterious malady," wrote Bunau-Varilla, a division engineer, "defied all precautions, laughed at all remedies, and all that the most expert physicians could do for its victims was to administer palliatives, the effect of which was moral rather than curative."

Yet the French did as well as could have been done, considering that the discovery of the mosquito transmission of yellow fever disease had not yet been made, whilst the Americans came to the Isthmus in the full knowledge of these two discoveries. The French had admirable hospitals which they ignorantly furnished with the means of spreading rather than of checking disease. For, in order that their patients might not be annoyed by the ants ubiquitous on the Isthmus, they placed the posts of the hospital bedsteads in bowls of water. In these bowls, then, the death-conveying *stegomyia* were bred; whilst no screens were put in the windows and doors of hospitals and other buildings, thus permitting the entrance of the malaria-disseminating *anopheles* mosquito.

GORGAS IN PANAMA

Such, then, were conditions in the Canal Zone before the Americans took possession. Its sanitary affairs were then put in the hands of Colonel Gorgas, who had so brilliantly applied preventive medicine in Havana. The then military governor of the Zone, Colonel Charles E. Magoon, assured Gorgas that all the government's resources in that region were at his service. Whereupon the cities of Panama and Colon were renovated, house by house; sewage systems were installed; the towns of the Zone were divided into districts for mosquito extermination; buildings were rat-proofed, to guard against the bubonic plague; medical inspectors began making daily house-to-house canvasses and to report suspected cases—all of which latter were at once, willy-nilly, segregated in hospitals; all potable waters were examined and foods inspected weekly, to guard especially against typhoid, the principal ingestion infection; the "typhoid fly" was suppressed.

The result? Gorgas and his associates have made this region as infection-free as any in these United States, and much more salubrious than a great many. Panama now rivals Palm Beach as a health resort. Yellow Jack has been absolutely banished from the Zone since 1906. During 1907 Gorgas did not have a single case of bubonic plague to deal with; he had 50 per cent. reduction from 1906 in malaria, typhoid, dysentery, pneumonia, and other grave diseases. His death rate was more than 80 per cent. lower in 1907 than in 1906. In the region over which he has had jurisdiction (the Canal Zone and the cities of Panama and Colon—a territory of 448 square miles, extending five miles on either side the canal route), he has had in his keeping the health of many thousands of men from widely dif-

ferent parts of the earth, engaged in digging through the swamp land of the erstwhile deadliest region in existence. In March, 1907, he had 36,000 employees under observation, with 122 deaths; in March of 1908 he supervised 43,000 men, with only 45 deaths. The mortality rate of the Canal Zone for March of that year was less than that of the City of New York, which is among the lowest, rural or urban, in civilization. During 1906-7 he had 1,273 deaths among 32,314 employees; during 1912-3 he had 483 deaths among 54,000 employees.

The French, with an average force of 10,000 men, lost during their construction period 22,000; the Americans, with an average force of 33,000 during about the same length of time, had 4,000 die.

In modern warfare, by the way, it costs about \$15,000 to kill a man. In the Boer row this item came as high as \$40,000. The Balkan mix-up with Turkey was conducted more reasonably—\$10,000 burned up in making one man food for powder. Gorgas, in the Canal Zone, has been saving human life at the actual cost of \$2.43 the individual. Sanitation in the Isthmus under Gorgas has cost just five per cent. of the total canal building expenditures.

When, then, the Panama Canal is open to the world's vessels let no one have to be reminded that this epic work could never have been accomplished had not devoted and zealous men, from Finlay to Gorgas, so magnificently, and with so much altruism, suffering and martyrdom led up to and applied the discoveries and resources of medical science to the colossal enterprise.

GORGAS AND MALARIA

And what Gorgas did against malaria in the Isthmus

and elsewhere deserves a section by itself. It is more difficult to cope with malaria than with yellow fever, although the latter is far the more fatal disease; because *stegomyia* breeds about human dwellings, whilst *anopheles* loves to roam afield and in rural waterways. Wherefore, to sketch the anti-malarial work were, as honest Cassio might observe, even a more excellent song than the other.

And the consideration is of universal importance, because the climatic and geographical conditions for the breeding of *anopheles* are ideal in the tropics all the year around. It was Ronald Reed, an English Army surgeon, who discovered in 1898 that the malarial germ, the *plasmodium* (which Laveran had demonstrated) is conveyed to man only by the bite of this particular species of mosquito. Nowhere else on the globe could The Lady Anopheline, who alone transfers the plasmodium (being here, as elsewhere in the cosmos, deadlier than the male) flourish so luxuriantly as in Panama, were not its breeding frustrated by sanitary science adequately applied. When malaria, then, can be practically extinguished from the Isthmus, the like can be achieved pretty much anywhere else, if the inhabitants of the given region have but the acumen and the backbone to go about the work. Here, then, is Gorgas' scheme:

1. The habitat of *anopheles* during the larval stage is destroyed within a hundred yards of dwellings. The larvæ of this mosquito live only as a rule in clear, fresh water that is plentifully supplied with grass and algæ. Drains are the most effective and economical plan; once put down they require no more attention; no water being exposed to the surface, there is no breeding place left for the mosquitoes; by means of a horse-mower or

scythe the grass over the drain can be cut. Failing tiles, an open concreted ditch may be put down; but the first cost here is nearly as much as for tiling, and the concrete ditch must constantly be kept cleared of obstructions in which breeding pools may be formed. Open ditches are the least effective and most expensive. 2. All protection for the adult mosquito must be destroyed. The adult is weak on the wing, not generally flying far and needing plenty of grass and brush for protection against the wind. Brush and grass are therefore cleared for a hundred yards around dwellings; where the locality is to be occupied for a year or more it is best graded and grassed, the latter kept well mowed. There is no objection to a little shrubbery or a few trees about a dwelling. 3. All habitations are screened, but effectively. Screens as ordinarily put up, without expert supervision, are of little use. Good wire should last three years; there is plenty of screening on the market that will not last six months. 4. Where breeding places cannot be destroyed by draining, larvæ are destroyed by means of crude petroleum, Phinotas oil, and sulphate of copper. The first of these is used in temporary pools, caused by bad construction, or at temporary camps where it would not be economical to drain, and wherever drainage is impracticable; the last two are used for killing the larvæ in the algæ and grass along the edge of a lake, a stream or a swamp.

For those interested in the health of industrial camps, Gorgas makes exceedingly pregnant observations: In and about the Canal Zone 50,000 laborers and their families have been scattered over 500 square miles, though they have been collected principally in some forty camps or villages along the line of the canal;

these 500 square miles are divided into seventeen districts, all under a chief sanitary inspector with the necessary clerical force and three assistants, of whom one is especially wise in mosquito lore; the second expert in ditching, draining, oiling, etc.; the third a competent executive. Each one of the seventeen districts has had its district inspector, who has had from forty to fifty laborers to do the necessary draining; carpenters to keep the screens in repair; and one or two quinine dispensers, who go about urging, though not compelling, employees to take three-grain pills as prophylactic doses. The district inspector has reported daily to the central office the number of malaria cases and the number of employees among whom the patients live. Each inspector has been held responsible for any excess malaria in his district. If the admission rate for malaria during the week has risen above one and a half per cent. something is considered wrong, and the assistants to the chief sanitary inspector are sent to discover the cause. These assistants have, moreover, been kept constantly busy over the work, advising and instructing the district inspectors. Herein Gorgas has found the gist of the whole situation: the district inspector and the working force, having usually no special knowledge of mosquito life and habits, have had to be constantly under the surveillance and supreme control of the sanitary officer and his trained scientific assistants, who have then been held responsible.

GORGAS TO THE WITWATERSRAND

The Chamber of Mines of Johannesburg invited Colonel Gorgas to visit South Africa and to study the sanitary conditions in the Witwatersrand mines. We may be sure that as a result there will be length

of days for many a poor Kaffir, who will otherwise have died untimely and most pathetically. Colonel Gorgas has gone with the consent and approval of our War Department. The workers in the Rand gold mines are reported to be dying off in great numbers of pneumonia, epidemics of which infection have been rapidly succeeding one another. And the invitation came because Colonel Gorgas has solved in Panama most beneficently this problem of pneumonia prevention, along with the others we have considered.

As in the Canal Zone, Gorgas believes that the pneumonia conditions are part of the grippe problem, because almost all cases of the former follow upon attacks of the grippe. People all over the world might profitably consider this. Grippe and pneumonia, like the other diseases we have dwelt on, can be abolished if the people concerned but choose; nor, as we have seen, would the cost be beyond the resources of any community, state or nation. With regard to grippe there is the erroneous impression that it is too trivial a matter to bother about. Well, the Dutch have put up a proverb in the house where Peter the Great studied shipbuilding: "Den Grooten Man is niets te klein"—to the great man there is nothing too trivial; and that is why the world may be confident that Gorgas will clean up that pneumonia job in the Rand and the grippe job along with it.

THE "KILL" IN GUAYAQUIL

Consider, by way of contrast, the graphic presentation of fourteenth-century conditions in a twentieth-century town made, under the above caption, by *The South American* of February 1, 1914. Guayaquil, Ecuador's principal seaport, is one of the unhealthiest

spots in the world. "It has a first mortgage on most of the malarial fevers in existence and yellow fever might almost be said to be an industry." Occasionally efforts, more gruesomely diverting than effective, have been made to fight infection. For example, at a time when there were a score of yellow fever cases in the Guayaquil hospital and the community was literally germ saturated, the local health authorities refused a party from the North desiring to go to Quito, permission to land on the ground that some of its members might bring in that disease. And many Northern papers were deceived to the extent that they praised the effective measures taken in Guayaquil. Again, there was an absurd plan providing for a large quantity of drain pipes to carry off the excessive rainfall; this, it seems, was because somebody had an option on a supply of pipe.

The bubonic plague appearing in Guayaquil, Dr. Lloyd, the American Marine Hospital physician, then on duty in that place, was employed by the municipality. But as the epidemic, by reason of his zeal, gradually lessened and cases became sporadic, the port "again became normal in its unhealthiness and one more disease, and that the deadliest, was added to the list."

But there is now hope of Guayaquil, because the rigid quarantine maintained at Panama by Gorgas is setting a standard which no other community, certainly none on the Mexican Gulf or the Caribbean Sea, can ignore. For no vessels coming from such ports or having touched there would be permitted to enter the Canal without exhaustive scrutiny and unendurable delay.

During two years past our own Government has been

quietly persuading the Ecuadorean Government to clear up the Guayaquil situation. And at the request of the latter, Gorgas, heading a commission of experts, visited Guayaquil, made a thorough scientific investigation of conditions, and submitted an elaborate report, which expressed no doubt as to the ability of real live, conscientious men to establish and maintain a clean, healthy port. The cost would be some \$12,500,000, about half the total commerce of Ecuador, approximately 90 per cent., of which passes through Guayaquil. Not prohibitive, obviously.

FROM "LITTLE REBEL" TO SURGEON-GENERAL

There is a fine "billboard" displayed in the metropolis intended for the wholesome influence of our youth. The ascending steps in the career of General Grant from the hardest conditions in life to the Presidency are presented, underneath all being the legend: "What will be your career with much better chances in your favor?" Colonel Gorgas, in an address delivered in June, 1912, at the commencement exercises of Johns Hopkins University, in Baltimore, said:

"I am bound to the Baltimore of a former generation by the closest ties of gratitude and friendship. I first came to Baltimore about forty-five years ago—a ragged, barefoot little rebel, with empty pockets and still more empty stomach. My father had gone south with Lee's army. At the fall and destruction of Richmond, my mother's house, with all that she had, was burned, leaving her stranded with six small children. She came to Baltimore and was there assisted and cared for by friends. These memories are vivid with me and can never be effaced." How beautifully rounded out, then, was this "human document," when Johns Hopkins gave

to Colonel Gorgas its honorary degree of doctor of laws. In conferring this Dr. Wm. H. Welch extolled Gorgas' signal service to his profession, to his country, and to the world by his conquests of pestilential diseases. "With high administrative capacity and with full command of the resources of sanitary science Colonel Gorgas has given to the world the most complete and impressive demonstration in medical history of the accuracy and life-saving power of a knowledge concerning the causation and mode of spread of certain dreaded epidemic and endemic diseases. He it is who, in spite of obstacles and embarrassments, has made the construction of the isthmian canal possible without serious loss of life or incapacity from disease—a triumph of preventive medicine not surpassed in importance and significance, in the conquest of science over disease, in the saving of untold thousands of human lives and human treasure, in the protection of our shores from the once ever-threatening scourge of yellow fever, in the reclamation to civilization of tropical lands—in results such as these are to be found the monuments of our laureate, his victories of peace, to which this university now pays tribute by such honor as it can bestow."

Many other just honors, many encomiums from every civilized nation, have come to this great benefactor. The latest is President Wilson's nomination of Gorgas (who had in 1903 been made Colonel by special act of Congress in recognition of his distinguished services) to be Surgeon-General of the Army of the United States, with the rank of Brigadier-General. The *Journal of the American Medical Association* has well observed:

"For his masterly ability as an organizer and ad-

ministrator, highest praise is due to Colonel Goethals, and any reward which Congress or the President may see fit to confer on him will be well deserved; but the mechanical construction of the Panama Canal differs from other engineering feats only in size. The work of the Sanitary Department under Colonel Gorgas has not only been the greatest task of sanitation that has ever been undertaken, but it is also unique and epoch-making. For the first time in human history a region which, since the earliest traditions of civilization, has been regarded as a plague spot in which it was impossible for civilized man to live and work, has been converted into a place fitted for enjoyable habitation and labor, with a death rate below that of the most modern cities."

The unique value of the work of Colonel Gorgas lies in his practical demonstration that regions of the earth hitherto closed to the white man can be made as habitable as any portion of our own country. Any section of the earth can now be made open to civilization. Nor can civilized man now recede to his own position of fatalism, resignation, or indifference, to the ravages of epidemic disease.

This, then, has been the career of Colonel Gorgas. It is characteristic of the man and of both the professions of healing and of soldiery which he so nobly represents that no reward in the form of great wealth has ever been his, nor would it have ever been considered or accepted. The satisfaction of work well done for the good of humanity is the modest distinction worthy of him and of his monumental work.

There should, finally, be a Department of Public Health in Washington, with a Secretary of Public Health in the President's Cabinet. Ninety millions of

people would be vastly benefited, in the most vital relations of life, by the appointment, with his acceptance, of Brigadier-General Gorgas to this pre-eminence.

THE ELIMINATION OF TUBERCULOSIS

My friend and colleague, and noble champion in the anti-tuberculosis fight, Dr. Mary E. Lapham, in a fine article in the *New York Evening Post*, quoted from my paper in *Harper's Weekly* that the tubercle bacillus is the essential, specific cause of tuberculosis and that, if all sorts and conditions of men and women would combine to help the doctor in preventing the spread of this germ we could eliminate the disease (consumption) from human experience. I had written also that "Tuberculosis is not only a doctor's affair, but is also the most tremendous economic and social degeneration in existence." Dr. Lapham considered these ideas of mine pretty far fetched; so, in extenuation of them, I wrote in *The Evening Post* the following:

Dr. Lapham and I, however divergent in our ideas of getting there, have our eyes on the same goal. The tubercle bacillus is indeed the specific cause of tuberculosis; there is no tuberculosis where the germ essential to the disease does not exist. But there are two elements in the evolution of consumption; the specific cause, the germ; and the pre-disposition, the state of the body by which it becomes a soil for the bacillus. The tubercle bacillus (I refer to the human type) cannot multiply outside the human body except under laboratory conditions. It is not (in the large aspects we are considering) a notable danger to humankind when contained in human excreta; the danger is mostly from human sputum.

CHILDREN RARELY BORN TUBERCULOUS

I think children are rarely born having the tubercle bacillus in their bodies, although all too many of them are born with vitiated tissues that are congenial to the growth of this germ. That infants and children become infected with the bovine tubercle bacillus is well recognized, and this situation is now being so conscientiously coped with that I do not think it need enter into the general problem. And I do not believe that tuberculosis in the other creatures mentioned by Dr. Latham is transmitted to humankind to the degree that we need consider it in this relation. In short, the consumptive's sputum is the main granary of human tuberculosis. And the gist of the matter lies in this: that the tubercle bacillus is the index to the fact, the nature, and the prevalence of the disease. The vital point for the layman to grasp, and then to make a part of his religion, an article of faith—absolutely undogmatic (though my colleague writes of my “dogma”), because nothing can conceivably be more demonstrable—that *the tubercle bacillus can get no implantation in a healthy body; for it the healthy body is stony ground*, this germ is a miserable saprophyte, depending for its subsistence, growth, and multiplying on dead, or devitalized, or sapped tissues.

That is why tuberculosis is a disease of the poor, of the submerged, a disease developed in sunlessness, cold, starvation, misery; in the overworked, exhausted, anxious body (for what is more predisposing, more sapping, than the anxious mind), and in the body devitalized by previous or concomitant diseases, of which alcoholism is pre-eminent. Wherefor I have ever maintained that doctors, having demonstrated beyond peradventure the causes of tuberculosis and how it can

be prevented, having clearly shown the way, it is "up to" the rest of civilization to work with the doctors in the altogether practicable, though epically difficult, business of vanquishing once and for all the Captain of the Men of Death.

Why difficult? Here are some reasons why:

WHERE THE TARIFF COMES IN

Think of a tariff that put an average tax of 42 per cent. on the necessities of life. Consider what Dean Henry Wade Rogers has written: "We all know that, no matter what may be the profits which come into the treasury of a Trust, the wage paid is the prevailing rate, the market price. The tariff has made the "Pittsburg millionaire" and it has also made the Pittsburg laborer. What the latter's condition is the *Pittsburg Survey* discloses. The consideration shown to the workingman is seen in the provisions of the Payne-Aldrich Tariff. By that act he is taxed 75 per cent. on his woolen suit, 12 per cent. on his shoes, 71 per cent. on his stockings and underwear, 50 per cent. on his cotton shirt, 78 per cent. on his woolen hat and gloves. The dinner pail he carries is taxed 45 per cent. The stove in his home and the pots and kettles are taxed 45 per cent. The common crockery on his table is taxed 55 per cent., his knife and fork 50 per cent., and his spoon 45 per cent. The window glass in his house is taxed 62 per cent., and there is a tax on the lumber or the brick with which the building is constructed, and on the paint and the wall paper used in its finishing. The food with which he makes his frugal meal is taxed, the sugar he uses being taxed 54 per cent."

We doctors tell the poor that in order to get well

of their consumption they have to eat abundantly of pure nutritious food, part of which must be half a dozen fresh eggs a day! What brute has ever been so vile as the human being who corners the food market; as those selling fowl putrified from storage several years back! Think of millions of eggs being held up for top prices while the poor are sold "rots and spots" (rotten eggs passed through sieves so that chick embryos three-quarters of an inch long shall not get into the stenching mess). And, when Christ's poor are treated like that, people have the Olympian nerve to speak of ours as a Christian civilization!

Then there is the ghastly inhumanity of gauging human labor by a law of supply and demand—a law natural only in so far as it is evolved out of human greed and human meanness—of valuing labor as one does lumber or pork or junk.

Tuberculosis is neither a hereditary nor a family disease—but a house disease, contracted chiefly in unhealthful tenements and workshops. A decade ago, when the idea of model tenements for the poor was launched doctors working among the tuberculous rejoiced; for here, it was felt, would be a most potent agency against the disease. But the model tenement of to-day is not for the poor—not in New York nor in Chicago; and Mr. James Bryce says it is not for the poor in London.

Nearly ten years ago, with what strength and clarity there was in me, I set forth such things as these in my book, "Consumption and Civilization"; things my colleague, in your columns, gives the impression—all most unwittingly—that I have never considered!

A preacher, on Tuberculosis Day a year ago, propounded the question "Does God Fix the Death Rate"; and he nobly answered himself, that God does *not* fix

the death rate. His God was not that kind of a god; his Providence no such providence. Man fixes the death rate by the war (industrial or with ordnance), the famine and the pestilence he makes; and by the same token, these unholy things are man-preventable.

WHO, THEN, FIXES THE DEATH-RATE?

Who, then, does fix the death-rate?

Those theologians, now happily diminishing in number, who ignore the demonstrated facts of preventable disease and seek to perpetuate the mediæval superstition that infections are the Almighty's merited scourges; those laymen who consider they are not their brother's keeper and who disparage a tuberculosis propaganda as of no personal concern to them; legislatures which give millions of the people's money for schemes that so frequently turn out crooked, when they will not give a thousand to health departments, for fighting a communal disease that destroys 10,000 lives a year—27 a day in one city alone; venders of patent medicines (mostly alcohol) and consumption cures, nostrum fakers who fleece their victims until the latter have passed far beyond the incipient stage in which physicians could have helped them; a "league for medical freedom," organized to prevent the wise centralization and co-ordination of health activities; those who overwork women and children in factories and are responsible for sweat-shop atrocities; those employers who require men to work at dangerous trades under intolerable conditions (some industries hold a consumption death-rate above 80 per cent.); those faith-healers and miracle-mongers who would blind the sick to the facts of disease until no cure can be done. Here is an army, having no conscience and owning no religion, that fix the

death-rate, which competent physicians, sanatorians, and humanitarians are trying—against such titanic odds—to lower.

I hereby earnestly implore the laity to be henceforth on the side of those forces that are bringing down the death-rate instead of training with malign battalions that are in the business of sending it up.

Dr. Latham is right. Our civilization has been most perversely leaving the brink of a frightful precipice unguarded while at the bottom are we doctors, Dr. Latham and the rest of us, helping to restore what few we can among the hosts that have fallen into the depths below. And though thousands have been helped and many fully restored, every third or fourth adult white and every other adult negro among us could not be helped and has succumbed entirely.

Well, what's to do; are we going to keep on standing for all this?

Goethe was told that a certain situation "must be so"—there was an immense authority and custom in favor of its being so—it had been held to be so for a thousand years. To which he answered: "But *is* it so; is it so for *me*?"

Lister, as a student in surgery, was told that putrefaction in wounds was due to the oxygen in the atmosphere; and there was no other way but that people had to die most horribly of gangrene, in fetid hospitals. But all this did not suit Lister; it was not so for him. And by his initiative humankind was freed of such conditions that Dr. Wrench, in writing about them, warns the squeamish reader to leave off with the beginning of the description and go on to the next chapter of his book on Lister. To-day—a short generation after—

we are amazed and disgusted at a civilization that would placidly endure such conditions.

The Panama Canal, of which Balboa dreamed, and of which Charles V was prescient, could never be built, declared Humboldt and Froude, because the isthmus was about the rottenest pest-hole on the globe; and De Lesseps' honorable failure was in large measure due to that fact. But all this did not daunt Gorgas; it was not so for him. And he forthwith made a canal possible—he assured it could never otherwise have been built—by transforming that region into a veritable health resort, with a mortality rate only two or three American communities can get under, and which is the despair of most others.

TUBERCULOSIS CAN BE CONQUERED

Tuberculosis can be eliminated from human experience; all we have to do is to determine not to stand for it. A century ago he who would have said such a thing about smallpox would have been declared fit only for a madhouse. For smallpox was decimating cities and wiping out whole towns and villages. The smallpox conditions of those days did not satisfy Jenner; so he went to work to get rid of that pestilence. And they called him mad, and a lot worse. And yet how practically obsolete is smallpox to-day; in 1912 just two smallpox deaths among some five million people! And the method of getting rid of tuberculosis is simpler (though in practice the task is confessedly titanic), because we don't even know the germ of smallpox, while we have the altogether adequate knowledge of the germ of tuberculosis I have outlined, and know precisely how to cope with it.

Is then the prophecy unreasonable that our posterity

a century hence will read with contempt and abhorrence of a civilization so stultified that, having the clear preventive knowledge, it continued to be content with so loathsome a thing as consumption?

Much has been done admirably by individual altruists, by societies, and by Governments, against tuberculosis. But the kind of work that has thus far been done will never completely eradicate the disease, because it does not deal adequately with the basic evils by which the Captain of the Men of Death does his gleanings.

And yet we are getting on. Conditions are not nearly so bad as they were a decade ago. While the rots and spots man still remains above ground, we have nevertheless (at last there is some real statesmanship in Washington) got the detestable tariff reduced from an average of 42 per cent. to an average of 26 per cent.; for all that it is still the miserablest laurel ever set on Mammon's brow. And we are somehow coping too with the Captain of Industries who bloodsweats his millions out of the poor, by demanding, and progressively getting, the living wage.

And if we could but unload ourselves of the charity broker, the charity politician, and the philanthropist who talks about "human derelicts" and "undesirables," we might be able to house the poor, the really poor, in wholesome tenements—a hundred model tenements for every one such now existing—and all conducted on a frankly business basis.

One must see how the tuberculosis problem is beginning to engage the consideration of discerning statesmen, who grasp the idea that all good government exists primarily for the maintenance of the home. And where is the home, what the human relation, what phase of our infinitely complex civilization, that is not wretchedly af-

flicted by the Great White Plague? Disraeli, Lecky, Goldwin Smith, Hughes—such men have and do comprehend this. Why, indeed, wait for future generations to act? To-day the end may begin to be fought for if, abjuring the tutelage of private enterprisers, and under the Presidency of our greatest statesman since Lincoln, our people will but determine to possess in themselves the sovereignty for which Washington and our fathers fought.

Another fine thing about Goethe. A man came to him with a tremendously difficult task and feared he could not get away with it. "Ach," answered Goethe, "all you have to do is to blow on your hands!"

Go to it, brother!

DANGER SIGNALS

These observations are addressed to the man of forty or thereabouts. My hope is that whoever needs to be, or thinks he needs to be, made young again in body, may find herein something to his ends. To begin with, I haven't the slightest notion of "throwing a scare" into anyone; as regards most people there would be very little reason for that. In reading about these danger signals (erected to flag the man on the street against ailments to which those of us over forty are more or less prone), let no one imagine that the jig is up for him, or that he can now see the grim specter beckoning—not by a long shot! I am especially concerned to make this preliminary statement, because a man's health and his hope of longevity are absolutely his most precious possessions; consequently when he gets morbid about his physical condition, his imagination often works terribly overtime. I am going to wind up with something about "factors of safety" in our bodies, which will certainly reassure many who, recognizing one or another of the danger signals mentioned, may conclude themselves to be down and out. My idea, then, is not to disturb, but only to urge, the man of two-score to take thought, in order that he may safely and pleasantly attain to his three-score and ten. And there will be no information as to "what is good for" this, that, or the other individual complaint or "misery"; the family doctor is the man to go for such advice, as

well as for consultation whenever anything is wrong in one's "innards."

EVERYBODY LOVES A FAT MAN

A great many of us are born with body habits, and others of us just naturally acquire them after birth; doctors call these habits temperaments, or, tendencies, or predispositions. To be born with them does not necessarily mean that we are born with the diseases they lead to or represent. In fact, abnormal heredity doesn't count nowadays for nearly as much as it used to; we are seldom born with the diseases themselves, but rather with tendencies to them. And these latter may manifest themselves as the real thing sometimes very late in life. And it behooves the wise man to recall anything of that sort in his family history; and then to guard especially against the disease to which it may lead. Here are some of these body habits:

Tall thin specimens, with slight small bones, slender ribs, and long narrow chests (that you can run your knuckles along as on a zylophone or a washboard) had just as well take a little interest in the present anti-tuberculosis crusade—especially if those with that kind of make-up have oval faces, a romantic expression, bright eyes, delicate skin and coloring, and run to art or poetry.

Some people are born with a tendency to obesity; these are by far the best-natured among our fellow citizens. Let such a one never hope to be lithe and willowy throughout his life on this mundane sphere—that is, if he is born with the obese temperament; the star part in "Patience" is not for him. Or, if a lady thus "tendencied" reads this, let her not hope to curl up in a buttercup, like the Fairy Queen in "Iolanthe."

Those who acquire "heft" in life are oftentimes "reduced" effectively enough, if they will only have the will power to stay so by keeping away from the flesh-pots. And why should the fat man want to bant? "Nobody loves a fat man." Nonsense! Everybody loves a fat man. Jollity, eupepticism, oleaginous geniality constantly ooze from him to bless and permeate civilization. The fat man is optimism's best asset; how cheerless we would be without him. The tendency to obesity is almost never successfully combated; and yet, seriously, there are some diseases of later life which depend on fat deposition in various organs, and against which it were well for the stout individual to guard when he turns forty.

HOW'S YOUR LIVER?

The short man, with the chest wide and round and large, must not aspire to play the trombone, or to march in a band tooting that huge instrument which encircles the body; and such occupations as glass blowing must be eschewed by such a one. For he has a tendency to wheeziness, to barrel chestedness, and to short windedness, which is likely to grow on him later in life—as with the undertaker in "David Copperfield."

Then there is the gouty temperament, which from time to time, according to the medical fashions of various eras, has been called the arthritic, or the rheumatic, or the uric-acid or the lithemic habit. Such people are apt to be pretty good livers, generally robust (seemingly so at any rate), well developed as to body, the face florid, the hair thick (and sometimes iron gray quite early in life), good teeth, the appetite hearty, good digestion, and a strong heart with high-pressure arteries. A century ago—in the days of the three-

bottle men—people of the gouty habit were prone to wine, especially port; to-day the trouble is not so much with drinking as with too much eating. (Pretty nearly all of us do that.) So the gouty have to prepare themselves against arterial and heart changes, kidney and liver trouble and apoplexy. It is quite as true to-day as when the dictum first appeared some twenty years ago, that a man is just as old as his arteries. With these physiological hose pipes (which deliver blood instead of water) sound, elastic, and unrupturable, their owner is young at seventy; he who has them of poor material is like to be old at fifty. And that venerable "Punch" joke—"Is life worth living? it depends on the liver"—is fraught with wisdom, as are almost all really good jokes.

RICKETS VERSUS EUGENICS

On the other hand, there is the lymphatic temperament—those who have been born rachitic, weak of body, poor blooded, not well developed, prone to catarrhs; they have little power of resistance and are constantly in danger of contracting some serious disease. Such people have in times past been among the world's greatest benefactors. It seems as if Providence, by way of compensation for their bodily handicaps, had given them noble souls, triumphant over their bodily ills by their indomitable wills, masterful men as to their brains, geniuses in literature and the arts and in world-enriching sciences. The human race cannot afford to let such inspiring examples as these pass away untimely; nor should there be occasion for that. Almost all these fellow mortals can be built up and made virile and able-bodied, as fit physically as mentally; and can, with proper care and guidance, live as long as any of us.

Then there is the neuropathic temperament; and this is a hard proposition: because there is so much innate cussedness in these very trying, though often most lovable specimens. And here it must be emphasized that there is no inherited tendency which cannot be successfully fought and downed—except possibly alcoholism, especially when it is bequeathed by both parents. But even thus handicapped, one can win out if he can keep from the Great White Way, go off on a ranch or to Patagonia, or anywhere outside of civilization, with a mentor able to help him control his addictions and his perversities—a dominant mentor, who could on occasion, if need be, hand over a good, healthy, corrective wallop.

EVEN NEUROTICS CURABLE

And as to the sin of the father which was visited unto the third and fourth generation, modern medical science has proved that, alone and uncomplicated, it seldom endures beyond the second generation—often, indeed, is not transmitted at all, although the Mendelians seem now to have something to say as to that. And yet it is an awful thing to have acquired; if you don't believe me, go and see Ibsen's "Ghosts," a play perfectly well founded on scientific fact.

The drug failings also are likely to be manifest in people of the neurotic temperament. And yet there is no drug addiction—cocaine, opium, absinthe, or any other—which cannot be triumphed over if only the right kind of fight is put up.

Just a parenthesis here about the acquired habit of taking the coal-tar drugs, acetanilide, and so forth, for headache and for that feeling the morning after. It is dreadful how prone young people are to these

things. I recall how, at lunch one day, our maid appeared with the face of a corpse, and with lips as blue as the ink I am now using. We sent her at once to bed, and upon investigation, this was the cause of her appearance: That morning I had received an advertisement of a coal-tar product, with tablets to try on my patients; as usual I promptly chucked the whole into the wastebasket. The maid in the morning found these tablets in the box, with the legend on it that they were good for headaches. She took not one but several, with the result narrated. Had I not restored her, she might have been fatally poisoned; nor would hers have been the first case of this kind, by any means.

Well, to return to the neurotic temperament: this can be triumphed over and brought to normal, but in most cases only after the bitterest kind of struggle. Remember that the three modern fates which govern human destinies are heredity, environment, and will. When the heredity is bad we have to offset it by a combination of environment and will, each of which is at least as powerful as heredity. So let the neurotic get into the outdoor world, which is his best environment; and let him gloriously exercise the divine human will. Then, believe me, he can triumph over the demon that would otherwise destroy him body and soul.

THE PACE THAT KILLS

And now a word about infection, heart disease, and the pace that kills. In England it has been found that one-third of all the deaths between fifty-five and sixty-five come about through damaged hearts; in the United States there has been during the last decade a con-

stantly increasing percentage of deaths from this cause. All doctors know that this is largely by reason of the worry, the hurry, the strain, and the dreadfully high pressure of modern commercialism, and social distinctions, and the mania for wealth—factors which tend to undue wear and tear of the precious organ which must supply the body with its life-sustaining fluid. The nervous system, which is basic for all existence, and which especially controls the circulation, is in one who feels that he has to cope with and be in and of the madding crowd, in constant stimulation. But apart from the nervous system is the fact that men of affairs, who have come down with pneumonia, grippe, or a like infection (the toxins or poisons in which are dreadfully disintegrative of the vital organs) can simply not be made to take the prolonged rest which is imperative for convalescence from these infections. Many of these patients—and elderly men too—are in their offices when they should most decidedly be in their beds. "Such a fussy lot, those doctors," declared one such; "besides, an old horse that once lies down never gets up." He put on his overcoat, went to business, returned that afternoon in collapse, and died next day. Another, a grippe convalescent, concluding he never felt better in his life, told his doctor to go hang, went downtown, and died in the evening. Another, a pneumonia convalescent, sits up to play cards with his wife, and drops back lifeless upon his pillow.

The fault is not here with the doctors, to whom it is not given to command the manners and customs of the age; they can but warn against fast living and against business habits conducive to such tension as must inevitably lead to an untimely break-up; they can but indicate the fever, the weak and uncertain pulse, the dysp-

nea, the blue lips, the cold finger tips, the ashy face, the distended veins in the neck—and tell the dire meaning of these danger signals.

And now as to the tendency to cancer: Many deaths from this disease occur after forty-five years; and most deaths between sixty and sixty-four are due to it. While consumption destroys humankind from adolescence to life's prime, cancer claims the greater number of victims in the afternoon and evening of life. And it is a curious phase of the law of compensation, that while consumption, the Captain of the Men of Death, destroys mostly civilization's submerged strata—the poor, the starved, and the exhausted—cancer on the other hand does the larger part of its gleaning rather among the well-to-do in life, those who have never felt the stress of poverty. Patrician cancer has a predilection for the homes of the prosperous. Cancer loves a shining mark—the illustrious, those of great worldly importance, those whom communities can ill spare, those who have, through many years of superb activity, fairly earned ease with dignity in a serene and respected old age. Nor is there any disease so insidious as cancer. Therefore let the man after forty, especially with cancer in the family history (though there is very little in cancer heredity), who notices any inflammation in the mouth, or whose indigestions are not easily relieved, or who has inexplicable pain in the abdomen; or the woman whose functions natural to her sex seem abnormal—let such sufferers frequently consult medical advisers of tried skill and reputation.

DO NOT WORRY

And finally about those factors of safety; they are our reserve forces, which avail us in time of undue

stress and strain, and which keep our bodies in fairly normal condition, despite the many chances we take and the various agencies inimical to human existence. The term was borrowed by Dr. Meltzer, of New York City, from the mechanical engineer, who must estimate the margin of safety required in constructing engines, bridges, and so forth. In mechanics it is calculated that given structures should be capable of withstanding not only the stresses of reasonably expected maximum loads, but also those of several times such loads. The factor of safety in mechanics is founded upon finite human ignorance of what might happen; and upon a wise desire to provide against contingencies. So the Creator has provided us with latent forces; the potential energy of many organs far exceeds the needs of normal, everyday humdrum existence. Surgeons take away a diseased kidney; and the patient gets along comfortably with his remaining kidney, living oftentimes to attend the funeral of many of his friends not thus handicapped. Then, again, four-fifths of his liver has been removed from a dog, who keeps happy thereafter with his remaining fifth; and so on. In the case of many of our functions the necessary mechanisms are doubled and even trebled. The function of one organ is often assisted by those of other organs. Living tissue is provided with one important factor of safety which is peculiar only to living things, and not to any other kind of machinery—that is, the means of self-repair. These factors of safety promote the integrity of life, the perpetuation of the species, and have an important bearing on the process of natural selection. And physicians know that most men and women complete the human span of life, despite the many diseases (sometimes indeed, despite the treatment for them), despite

accidents, and other untoward circumstances to which humankind is constantly subjected.

So do not worry; but do heed a danger signal, especially when it lights up after forty!

MASSACHUSETTS

THE PREVENTION OF CANCER

Cancer is one of the few problems remaining for medical science to solve. Its essential nature is not yet fully determined. But the study of it is intense; the civilization-wide field has, for a generation past, been entered by so many able and experienced delvers, all in generous rivalry to be the first to bestow upon their kind the epic boon; so abundant are the material resources which the sympathetic rich have put to the service of these workers; so noble and so distributed are the cancer research institutions (justifying the claim of Harvard's President Emeritus that no religion can be valid which does not recognize the beneficence proceeding from their walls); so loyal is the co-operation of governments—that the unraveling of the cancer mystery cannot surely now be longer delayed. I shall advert to the prevalence of cancer; how it invades the human organism in its prime—the world worker upon whom human progress depends, the mother to whom humankind must look for its life; how practically incurable is cancer when once established; and other most momentous considerations: but my emphasis will be laid on the possibility of preventing half our cancer cases by prompt and adequate action in the “precancerous stage.” “What cannot be cured must be endured” is an excellent dictum, satisfactory, like all philosophic reflections, to those who have not, nor need fear the incurable thing; but neither the cancer sufferer nor his physician can get much comfort from it. And

Doctor Parker Syms, in an address on cancer under the auspices of the New York State Medical Society, has given us a better saying, that "what cannot be cured may be prevented."

THE PREVALENCE OF CANCER

Cancer is considered to be very much on the increase, although this may be only apparent and by reason that our modern statistics are better prepared and based on more accurate knowledge and observation. For my part I must believe that there is an increase. Because, unlike tuberculosis, which affects mainly mankind's submerged strata—the starved, the ill-clothed, the devitalized—cancer has had comparatively, by no means always, a patrician predilection; its tendency, except for the superficial cancer, which results mostly from injuries is for those after forty, in whom eupepticism unrelieved by exercise in this motor car age has left, as it were, unburned or unassimilated klinkers to clog and corrode the bodily machinery. Then, too, twentieth century preventive medicine has been wonderfully instrumental in preserving the lives of many who would formerly have died in infancy and youth; and certain of these survivors have probably later on contracted cancer and added to the percentage of its incidence.

However these things may be, cancer is known to affect humankind exceptionally before the twentieth year, rarely before the thirtieth, whilst most of its victims are between thirty and old age, the majority being between forty-five and sixty-five. The disease is considerably more than half as prevalent as tuberculosis. The latter, The Captain of the Men of Death (in John Bunyan's tremendous phrase) has been destroying every third or fourth adult white life and every other negro

life between adolescence and fifty. Cancer is nearly six-tenths as prevalent as heart disease. It is nearly as prevalent as pneumonia, which in certain times and places has had as high an incidence as tuberculosis. In the United States there are now nearly eighty thousand cancer deaths annually. In England one woman in ten dies of cancer and one man in eleven. The disease prevails more among women than among men because in most women it attacks the organs peculiarly feminine. Apart from this, cancer prevails more among men, especially that of the lips and stomach.

WHAT IS KNOWN ABOUT CANCER

Cancer is a malignant growth, malignant because its tendency is to increase and ramify into previously healthy parts of the body, until it destroys life. The word means crab; and by it some Greek many centuries ago, with the genius of his race for trenchant characterization, expressed the insidious, tentacle-like reaching out from the sinister growth until ascendancy has been gained over the sufferer. One sees here also why operation must not be delayed until the offshoots, every one of which must for a cure be entirely removed, invade regions often remote from the original seat, and which the surgeon cannot safely reach. For, if any cancerous tissue remain, there will, with very rare exceptions, be recurrence months or years afterward, with practically no hope of permanent or positive cure in the present state of medical knowledge and experience. Complete removal by the knife of a strictly localized cancer, before it begins to ramify, will give a cure—the only assured cure. But a cancer, at first a purely localized disease, is like in time to have portions of the primary tumor conveyed elsewhere through lymph and

blood channels; and when such secondary growths obtain science has no remedy to give.

It were hardly well, except in the medical press, to amplify such considerations; the physician's consultation should bring them out. But certain things are appropriate to be stated here. There is little if any reason to believe cancer to be hereditary; nor that it is a communicable, infectious disease; nor that it produces in the sufferer a future immunity in the way that he who has, for example, an attack of smallpox need never again fear that disease; nor is there at present a specific cure for cancer, by drugs or chemicals, of serums or vaccines, although some superficial cancers appear to have been cured by the use of radium and other such means.

THE PRECANCEROUS PERIOD

We know this most important thing about cancer—that there are certain bodily conditions and certain ailments predisposing to its development, and which constitute the precancerous state or stage. Except after blows or other injuries cancer will not develop in normal tissues. It is by recognizing this stage in time that forty thousand of our people can annually be saved from death by this appalling affliction.

How is this to be done? Nearly half the cancers have a precancerous stage that ought to have been detected. "Benign" tumors, not in themselves death-dealing; prolonged irritation; disturbances of function through years; chronic ulcerations, especially of the stomach; inflammations; injuries, abnormal tissue, as scars or stumps from old operations—such are conditions which must be feared as leading to cancer.

Every benign tumor, however innocent to begin with,

is a potential cancer; if "operable," it should be removed, lest cancerous infiltration take place in it. Thus may not only a definite and permanent cure be vouchsafed; but also such a relatively slight and shockless operation give the least disfigurement or mutilation. Certain kinds of moles (birth marks) may take on malignancy; if these were removed in the precancerous stage there would most likely be no recurrence and no internal migrations of the cancer cells to other and remote parts of the body. When these moles have become definitely cancerous they are exceptionally serious.

Cancer is always a tumor, a swelling, a "lump" as many people say. The laity are apt to think of a tumor as necessarily meaning a cancer. But to the doctor any kind of a swelling (and there are at least a score of them) is a tumor. Also there are several kinds of cancer, differing in the degree of their malignancy and in their course. Superficial cancers, as those of the face or lip, are reasonably recognizable by sight and touch and by a microscopic examination. Immediately such a thing appears medical consultation must be had. Of course, such a thing may not be cancerous; further description is withheld in order not to arouse pathophobia. Deep-seated cancers are much more difficult to detect; oftentimes the only indication of them is a functional disturbance of the organ or tissue involved or perhaps also of other and associated organs. Wherefore those after forty, especially women, and certainly those after forty who find their health not as it has been should go without delay for a medical examination.

Irritation prolonged through months and years all too often leads to a cancer at the site of the irrita-

tion. Thus there is the clay-pipe cancer; there used to be the chimney sweep's cancer; there is that of the tongue from the jagged edge of an untreated tooth; the laryngeal cancer, from the inveterate smoking of strong tobacco; the cancer from X-ray burns (how long the list of medical martyrs who have suffered thus); the cancer from prolonged exposure to the sun; that from insect bites or intestinal parasites; that from betel-nut chewing in India; from eating very hot rice in China; the kankri cancer in Thibet. (The natives carry in their tunics a pocket stove, the kankri, the constant use of which is followed by cancer at the site of the burn.)

Prolonged disturbance of function not amenable to ordinary treatment should excite suspicion that has imperatively to be dissipated; especially is this so of the digestive apparatus. Function and structure are as inseparable as mind and matter; abnormal functioning must inevitably lead to diseased structure. Anemia, nausea, indigestion, loss of appetite, of weight, strength and stamina, jaundice, bleeding from the stomach, uneasiness, pain and tenderness on pressing below the breastplate—such things should excite apprehension that has to be dissipated. Gastric pain has been considered to indicate cancer and its absence to remove the occasion of fear; but here were a broken reed to rely on, for even advanced cancers have given no pain. These warnings must be emphasized for men after forty who have been alcohols or habitual eaters of irritating, indigestible and super-abundant food. And the most heartrending cancer cases are those of women who have neglected the warnings given by discomfort and functional disturbances.

THE CURABILITY OF CANCER

Cancer is curable in many cases; some forms of it are much more easily curable than others; and cancers in certain parts of the body are more curable than those in others. The disease is always localized at first: operation then especially by the recently evolved and most beneficent procedures for which the world is indebted to Doctor George W. Crile of Cleveland, would mean the removal of the entire growth and cure in many cases. How many? Some operators have demonstrated eighty per cent. of cures. Operation not early, and with extension, has given fifty per cent. of cures. But when complete removal is impossible, operation will work temporary relief; but there will be recurrences and no absolute cure. Though many other methods of dealing with cancer have been and are being tried and advanced, they are at present all experimental, nor can the value of any of them be vouched for.

WHAT IS THEN TO DO

Much, then, that is preventive can be done in the precancerous stage. When any sign here indicated is obvious, give place to the physician, who will call if need be a surgeon into the council. But operations are such dreadful things! Nonsense! They are to-day, the most of them, no worse than a holiday jaunt. Anesthesia is nowadays so perfected that it is positively delightful and safer than a joy ride, by far. The anesthetist is like to ask the woman patient what is her favorite perfume—rose, lavender, violet; the man his favorite cocktail? A turn at the apparatus is made; one inhales the delicious fragrance, and has hardly the time to enjoy it when nature's soft nurse has intervened. Dangerous? Surgery is nowadays so nearly ideal that

remarkably little risk of life is entailed. Why, bless you; the operating table is almost the safest place in existence; though later operations are confessedly extensive, severe and dangerous, operation for the early cure of cancer has a mortality of no more than one per cent. And think of the rest one gets. A fortnight or so of absolute relaxation in bed, a rest such as almost every man or woman among us, sick or well, would be the better for. How much better off indeed, would the whole country be if such felicity (as they say in the minstrel shows) should eventuate.

Don't delay. Even as things are now sixty per cent. of superficial cancers and nearly forty per cent. of those deep seated are operable, with very fair prospects of cure. By earlier operation proportionately better success would be attained.

Nor rely on palliatives; nor on faith, mind or healer's cures (How would the Master, with His "if thine eye offend thee, cut it out" abhor such unholiness.) And has finally the cancer got beyond remedy? Then must philosophy and religion bring their consolation (this they did in other eras—why should they not in ours); whilst the physician, though he cannot give euthanasia can nevertheless assuage the suffering and make it endurable. And St. Paul could give help too. For when he besought that his incurable disease, his "thorn in the flesh" might be made to depart from him, and it did not, despite his prayers (for there was no miracle, even for one so worthy) he was comforted by the divine assurance "My grace is sufficient unto you."

DON'T BE A HERMIT CRAB.

"I have read somewhere," observed the doctor, "how a naturalist, studying the difficulty a butterfly had in breaking from its chrysalis, determined to help along the little creature's will-to-live by cutting through some impediments that bound it, so that it could the more easily free itself. And what had that tender-hearted scientist accomplished by his helping? Instead of coming out strong and beautiful, the butterfly was a frail thing indeed. The struggle of which the mistaken kindness had relieved it was the very source of the strength of the body and the iridescence of wing it should have begun life with.

"It is the same way, I understand, with ducklings that are helped from their shells. They differ from those that just have to struggle out in being stunted any puny, if indeed they do not have to die at once, or soon after the too-kindly hand has helped them out of the egg shell stage of their development.

"The other day I visited the aquarium at the Battery in the metropolis. In that most absorbing panorama of fish life, from the ingratiating seal down to the tiny sea-horse—a specimen of which that profound though untutored psychologist Barnum worked off on the 'easy' American of his day as a mermaid, a horse on the public as it were—in that aquarium are two adjacent tanks, one containing the real crab, the other a deplorably poor relation of his, the hermit crab. The difference is decidedly worth considering. The real crab, in his

native waters, leads a rough and perilous life, among jagged rocks. He is dashed about by every wave, whilst on all sides his piscine enemies attack him. So his kind, throughout its struggle for existence, has through crab-aeons developed a strong and serviceable coat of mail—a hard shell. Certainly the real crab is entitled to admiration; and he has businesslike appendages that excite a *noli-me-tangere* sort of respect.

“But not so the hermit crab, whose forefathers long ago imagined they had hit on a good idea, when they stole into the well-built homes that had been developed and then abandoned by other mollusks. And what has been the result of such house-free policy? Why, generation after generation this foolish kind of crab, dwelling in its stolen tenements, has ceased to bother itself about questions of safety or of any struggle for existence, such as ennobles all forms of life that enter into it. Consequently, nature has written this sin against evolution, this semi-parasitism, most plainly upon the hermit crab’s organization, for any one to read and to be disgusted over. This miserable, shabby-genteel semblance of a crab, has suffered in its anatomy precisely to the degree that it has ignobly borrowed or filched from his neighbors. Not now a lusty, perfect, commendable, high-class crustacean, its body is sadly weakened, several of its vital organs are partly or wholly shrivelled up, and its sphere of life—with all the glory and satisfaction there should be in that—has become pathetically limited. Having by a cheap and unworthy expedient secured safety, it has in consequence fatally compromised its independence. Not now needing to construct its own coat of mail, a vital inducement to a life of dignified and vigilant exercise of its own powers is correspondingly withdrawn. A number of bodily

functions have struck work; by a stern law of evolution—that an unused organ must atrophy—the hermit has not only lost all power in certain parts, but also those parts themselves. Instead of the thick, chitinous shell of the self-respecting crab the hermit can now show only a membrane absurdly thin and delicate; this half-naked and woebegone hobo of the seas presents limbs now rudimentary, or so small and frail as to be but laughable excuses for limbs. And the only compensation for all this degeneracy is that such additional tail development as will permit it to hold on to its stolen retreat has been acquired through nature's suffrance. Obviously, in the near biological future the hermit species of crab will, by reason of its racial senility, become extinct.

“There is an enormous amount of semi-parasitism and parasitism in the cosmos, so far as our ken goes. There are many forms of life—the dodder, the mistletoe, and so on—that will not take the trouble to find their own food, but borrow or steal it from the more industrious; here is oftentimes an acquired habit and a very bad one, for which nature invariably exacts a dreadful penalty. Almost every animal is a living poorhouse, harboring *lazzaroni*, supplying them gratis, not only with a permanent home, but with all the necessities and indeed all the luxuries of life. The animal is thus an unwilling host, to its own prodigious discomfort; and often indeed to its death, by such relationship. It is a most debatable philosophy, that of David Harum, that ‘a moderate amount of fleas is good for a dog—it keeps him from broodin’ on bein’ a dog.’

“Now the point of all this lies in its application to the human parasites, of whom there are a vast number

subsisting on the rest of us; this hurts us considerably, but it harms them a great deal more. In the biologic scheme the genus homo is conditioned as to his life processes, precisely as is every other creature in the cosmos. Man is most perversely stupid to imagine the universe to be anthropocentric so far as willing is concerned. In the presence of the eternal verities he is as helplessly pliable as any other sentient thing; the modern fates—heredity, environment and function—master him as did those of mythology; and he cannot evade their shaping of him any more than can the dodder and the hermit crab.

“They who eschew effort, and are unwilling for struggle and suffering are lost. And, whilst going through a process of self-destaminization, the indolent and the selfish inflict a most grievous phlebotomy upon the virile and the self-respecting portions of our really sublime race. The evil is obvious in various ways: for example, the charity that helps the individual to help himself is altogether laudable; but indiscriminate almsgiving is a cruel wrong both to the recipient and to his community. Consider also the paternalism which ‘just now is rather rife’; when will the body-politic come to appreciate that what its government bestows upon some of its people must inevitably—there can be no other source—be abstracted from the remainder of the citizens. The only way—there can be no other—by which the government can be humane and generous is by taxing you and me and Jones and Brown and Smith and Robinson.”

“I am inclined to believe,” observed the evolutionist, “that all manner of charity is futile; and mistaken, in that it seeks, in violation of nature’s laws, to preserve the unfit. Were it not after all better for the race in

general if its weaklings were left to die off—humanely, of course; are not, for instance, efforts on the part of you doctors to save the lives of consumptives, especially of tuberculous infants, really misdirected, in that they violate the Darwinian law of the survival of the fittest?

Is not the continued existence of the weak an additional, an unfair and a useless burden upon the strong and a handicap upon the development and the progress of the fit? Were not the Spartans wiser than we in throwing their unhealthy born infants to the wolves—though of course I would not stand for any such thing as that, but only for a kind of blissful euthanasia, by which our unfit might be helped toward their oblivion. Anyway they considered—did the Spartans—that the claims of the individual and of the race involved in these respects a contradiction that could be sensibly adjusted in but one way: they would not save a sickly infant, because to do that would be contrary to communal hygiene, which would have for its ultimate object the improvement of the race.”

“And yet they were most deplorably mistaken, those materialistic Spartans”—here warmly broke in the humanitarian—“as history proved; for they were eventually overcome by the brainier though less brawny Athenians.

“You err,” continued the humanitarian, in considering this tenet of the survival of the fittest to have only a physical, a materialistic phase; whereas if it is to have the slightest value in philosophy, it has got to be indicative of evolution in all its aspects. Evolution, to be a philosophy worthy the name, has got to be an all-comprehending system, upon which consistent living can be based; it has got to consider not only the purely

physical, but all other aspects of life as well—the mental, the moral, the emotional, the spiritual—an evolution inclusive of the humanities. For no doctrine in philosophy is surer than that the physical, moral, mental, spiritual and all other phases of existence are inseparable and mutually affecting and affected parts of the individual being—monistic, in short. The most practical Gradgrind, the coldest political economist, the most austere Statesmen, will grant this, as well as the most susceptible to the emotional—at least they will if they be men experienced in dealing practically with human conditions. On such basis then, a sympathy for the weak and the afflicted, and a helpful solution for their return to health and strength is altogether logical; otherwise the conclusion is inevitable that civilization, the *wille zum guten*, altruism, and of course Christianity, have been and are now colossal mistakes.

“If,” continued the humanitarian, “this broad view of evolution be accepted, who would dare take it on himself to discriminate or to select from among his fellows ‘the fittest’ for survival? There are just now some very well disposed people whose presumption in making these premises is making them ridiculous and even intolerable; and are the eliminators and eugenizers themselves so immaculate that they need no attention in the premises? Who is to manage their business for them?”

“Many a useful man who has given substantial comfort to others, has been unhealthily born and has had his infant life hanging month by month by a thread until the scale has been turned existenceward, with results most beneficial to his kind. The biographical dictionaries furnish the names of many a weakling who, having

triumphantly grown to maturity, has impressed himself upon his civilization, to its great good and profit.

"The case of Smiling Joe springs at once to mind. What! you've never heard of Smiling Joe? He is the little fellow that, having Pott's Disease of the Spine, lay for two years on his back, strapped to a surgical frame so that he might not die of bone consumption, or that, in any event, he might not grow up a hunchback. There are those who would declare this poor, sick tenement child had better have been left to perish—or, speaking by the book, to undergo natural elimination in the process of the survival of the fittest." (Here the evolutionist reddened and seemed pained, for he was really a well-meaning and good-hearted man; they seem cruel but are not, those Darwinians; it is only that they have to scrap in behalf of their theory.) "Well," went on the humanitarian, "by just lying on his back, and smiling through his sufferings, and keeping on smiling the smile that wouldn't and couldn't come off, tenement Joe effected more than most able-bodied men could ever have hoped to. Principally by publication, throughout pretty much all civilization, of a picture of his smile and of his patient little body strapped to that frame, a fund of a quarter of a million dollars was collected, with which they are going to build by the seashore a hospital for tuberculous children!

"And yet, even in the evolutionist's creed (it is held somewhere, I believe, that there is in nature a constant struggle for recovery of lost perfection, a struggle in which she much oftener succeeds than fails—in the long run at any rate, if not in the first attempt. Is it not so (appealing to the doctor) that in medicine this striving after lost perfection is as much a part of nature's healing power as is the force making for recov-

ery—the *vis medicatrix naturae*, I believe the phrase runs—in most cases of sickness? And has it not been observed among physicians that weakly parents not infrequently beget strong children?”

The doctor nodded appreciatively; for the humanitarian was a man after his own heart. After all is said about the sordid, stolid and vivisectioning medical profession, the doctor and the humanitarian are twin brothers.

“Yes; for example there are tuberculous parents who have had born to them virile children, whose chances against consumption, oddly enough, have been rather better than those of untainted parents. Before adolescence there are comparatively few deaths from tuberculosis; the period when this disease manifests itself most and during which most deaths occur from it being between fifteen and fifty years. So there is a long period of latency when, if the child be well-environmented and nurtured, he will be likely to overcome such untoward tendencies as he may have begun life with. Here surely are evidences of an unright and honorable offer on the part of nature to remedy her defects. She surely is entitled to have us emulate her. We ought to help some ourselves and not expect either her or the Deity to do everything.

“But to return to human parasitism. Obviously how to be both humane and wise is one of the most tremendous problems of civilization. It might well make ‘another story,’ as Kipling would say.”

THE COWARDICE OF BRAVE MEN

The dinner had been delicious, the wines mellowing, the table setting exquisite, the flowers subtly fragrant, the lights soft and varicolored, the gowns of the ladies most symphoniously blended; the ladies indeed had been adorably charming and gracious, whilst none of them, thank goodness, had been so rapturously beautiful as to disturb the evening's harmonious relations; all betokened the truest kind of hospitality, such as a eupeptic bishop once extolled. The ladies having left for the drawing room the gentlemen lit up.

"I have been reading," observed the *bon vivant*, sipping his liqueur, whilst his eyes turned beatifically toward Aurora (with her attendant maidens) on the ceiling—I have been reading of a Frenchman who, whilst visiting New York, was so afflicted with germi-phobia that he abruptly cut short his visit and suddenly returned to that dear Paris, where in his belief germs are fewer or anyway more amenable to restriction than in the rampant New York atmosphere."

"Fear is indeed a curious thing," said the member of the opera club. "I remember that at the time of the earthquake in San Francisco the Metropolitan Opera House singers were visiting that city. Among them was a justly famed *basso profundo*, several inches over six feet, of physical architecture superbly proportioned to his height, and of noble, indeed most martial bearing. In the course of his operatic engagements his roles frequently called for feats of desperate hero-

ism; such as inviting, in stentorian tones, the whole male chorus to spit themselves, in turn on *en masse* (as to this he was indifferent) upon his naked blade. And his organ o'ertopped the whole orchestra, including the brasses, the kettledrums and all the rest thrown in. My soul is thrilled and wholly satisfied in the recollection how this epitome of valorous ages did these turns. On such occasions I invariably felt I had the worth of my money and more, even without the gargling soprano and the rhinociferous tenor thrown in. Then came that earthquake, which wrought a most melancholy change in our full-throated cavalier; the shock, it seems, completely disorganized his psychism—I think that's what those psychologists call it. For many weeks he was, like the Hibernian about to propose, all of a thrimble; the scene of his erstwhile spectacular heroism knew him not; and when finally he did reappear, it was as the peace—adjuring, altogether innocuous monk in *Romeo and Juliet*."

"Well," observed the scientific guest, "it wasn't the basso's fault if he was a less courageous man after than before the earthquake. Some might consider he hadn't been of heroic mold at all, only mimetically brave; but I am not, for one, at all of that mind. I consider, indeed, that there being so much of him, his proportions being so huge, he must have experienced a relatively greater shock, and have shown its consequences more than would a slight and wiry party. And what is shock? It is a profound disturbance of the normal interaction of the great nerve centres, and consequently of all the organs and tissues, which the nervous system controls and regulates. The cause of the shock will generally come from without. And overwrought emotions are very conducive to fear; how often have the

affections unmanned men! Again, one dreads an anticipated event, such as having to make a speech; the fear of which is dissipated immediately the action is begun; the trouble is then to stop such a man, who in the halcyon realization there was nothing to fear after all, is like to keep on *ad infinitum*. Or the danger may be reasoned out; and the fear may lie in the assumed inability to cope with it."

"Consider, too," said the doctor, "that all healthy living is the right adjustment of the body's functions to its external relations. And it is not to be wondered at that disorganization will follow upon so irregular and unexpected a thing as an earthquake butting into the customary environment. Then there is also the physical condition of the individual, his being perhaps below par, at the time of the hitherto inexperienced disturbance.

"That is so," said the West Pointer. "Men strong, virile, well-fed, associated in companies and in daylight, each with his internal relations in good working order, will not so easily fear as those who are exhausted after long marches, starved, the body-machine not well fueled, isolated and at night. Yes, there have been glorious instances to the contrary, as at Valley Forge. Everybody knows, of course, about the two o'clock in the morning courage; any man brave then, when the body is weakest, is indeed a wonder. Recall, too, how Mulvaney, after he had circumvented a few stiff drinks, "felt schornful of elephunts," and achieved his historic mastery of a mastadonic "rogue" that was terrorizing the neighborhood. And it is true that the unaccustomed things make one afraid: the soldier exulting in the smell of powder and the detonating ordnance might well tremble in the presence of a virulent plague; the doctor

and the nurse, being accustomed to pestilence and held to cope with it, seldom succumb to infection, to which fear, I understand, is wonderfully conducive. We are all of us afraid until we get used to things. This has been so of many famous commanders—of Augustus, the victor at Actium, of Turenne, of Napoleon, of Ney. ‘A coward is he,’ declared the bravest of the brave, ‘who boasts that he was never afraid.’ Demosthenes talked fight aplenty, but he ran away from his first engagement, as did also Cicero. I recall the incident of the Russian commander about to mount his steed; as he stood, his legs trembled—with fear. ‘Damn you,’ swore he, looking down and apostrophizing these unruly members; ‘for this I’ll take you where it’s hot!’ Upon which he vaulted into the saddle, charged into the midst of the fight and was killed.”

“One of powerful imagination, of lofty temperament, of fine acute sensibilities,” observed the novelist, “will evince fear such as would be beyond the comprehension of a clodhopper. And an apprehension of disaster, however ill-founded, may, like the *crescendo* in music, lead to a veritable palsy of fear, inhibiting reason—which is the most supermannish of our acquisitions, the last developed and the first to be relinquished: and so an abject and helpless terror seizes on one who could not fairly be called a coward. Kipling in one of his stories, describes the quivering dread of something that you cannot see, a fear that dries the inside of the mouth and half the throat, that makes you sweat on the palms of the hands, and gulp. This is a fine fear, wrote Kipling, a great cowardice, and must be felt to be appreciated. De Maupassant also wrote of fear (which, he said, the boldest man may feel) as a sort of decomposition of the soul, a terrible spasm of brain and

heart, a kind of reminiscence of fantastic terror in the past."

"Well, then," said the scientific guest, "the essence of fear seems to lie in the instinct of self-preservation; it is the signal to the sentient creature, human or otherwise, to protect himself as best he can, against hurt or death. But speaking of germiphobia. It is odd what a variety of phobias are experienced by people not especially timorous, and who are only so with regard to the one phobia that particularly affects them. These fears are instinctive; sweet reasonableness plays no part in them. There is claustrophobia, the fear of closed spaces, which was so dreadfully suffered by Hamerton, who wrote the *Intellectual Life*, and who was in all other respects a superbly normal Britisher, a good rider, a swimmer that could smoke his pipe in the water and all that sort of thing. Then there is, on the other hand, agoraphobia, the fear of open spaces which appears to be a legacy from our remote Simian ancestors, who were arboreal in their habits. Therein indeed lay their salvation from utter extinction, and the possibility of our own more or less fortunate existence, through the Darwinian processes. Monkeys in the tree tops could with impunity satisfy their jocund propensity to pelt with cocoanuts the foe on the plain below. Comparatively feeble in body, they were safe only by reason of the agility with which they could climb out of reach and swing from bough to bough and tree to tree. But that monkey who descended to the ground was like to be done for; on the flat or in the jungle he had little chance against the spring of the tiger or the speed and wind of the wolf. So our arboreal forbears had an instinctive aversion to extended excursions; and their present day descendant

who suffers from agoraphobia craves to be near, not necessarily trees, but some vertical protective structure; in going about an open square he actually hugs the sides of buildings; with a stout cane in hand or with a companion he is not so fearful. Then there is ailurophobia, the fear of cats, which a cousin of Dr. Weir Mitchell suffered; the cat might be invisible to him, in the next room perhaps; but he could not stand for it to be in the same house with him. Also there is ochlophobia, the fear of the stare, which seems to be a phenomenon not rare in Germany. It is inflicted upon those who inadvertently cross gentlemen in the military way. I have, fortunately for me, not as yet experienced the insistent, horrendous, glassy stare of the Berlin Herr Lieutenant; but I am informed the Krupp works do not turn out a more paralyzing weapon. And how many, not otherwise lacking in courage, have shrivelled before the Gorgonian British 'who the devil are you' stare. These are but a few of many phobias."

The host had left the room for a moment, and was now returned with a book from the library. "We were mentioning the timid speaker; as to that here is something from Carlyle. And he read:

"The speaker is as the ass whom you took and cast headlong into the water. The water at first threatens to swallow him, but he finds to his astonishment that he can swim therein, that it is buoyant and bears him along. One sole condition is indispensable—audacity, vulgarly called impudence. Our donkey must commit himself to his water element, in free daring strike forth his four limbs from him. Then shall he not drown and sink, but shoot gloriously forth and swim, to the admiration of the bystanders. The ass, safe landed on the other bank, shakes his rough hide, wonderstruck

himself at the faculty that lay in him, and waves joyfully his long ears. So, too, the speaker."

The West Pointer evidently had something in his system that he wanted to get out. Presently it came this wise: "At the time of the Boxer rebellion there was at the legation in Pekin a young lady I had previously met in Washington, and who has since become my wife. Whilst our forces were in Tien Tzin you may imagine my only fear was lest we should be too late; and I am sure that with my last breath I shall bless my commander for having told the generals in council they might wait if they would, but that for his part he was determined the American troops should advance at once upon their business of rescue."

When the tributary glasses had been drained, the Baron, who had thus far listened much and said nothing, was appealed to. This Baron, venerable, his hair and pointed beard grizzled, his back straight as a ramrod, monocled, was a gentleman living, in the twentieth century, the Henry of Navarre traditions. An incident will illustrate the rare type: On the Baron arriving in New York a slick American, who had scraped his acquaintance, borrowed of him two hundred dollars, to be returned on an arranged date. When the time came the borrower having failed, the Baron being himself pressed, reminded him of the obligation. "Have you a note?" asked the borrower. "Why, no," returned the Baron, "this is an affair of honor, not of business." Whereat the borrower told the Baron he might whistle for his money, or words of that tenor. A friend who knew of this then observed by way of sympathy that if this had been the time of the Fourth Henry the Baron would have run the swindler through. "No, indeed!"

rejoined the Baron; "but my lackey should assuredly have flayed him!"

Well, the Baron now spoke: "In the heat of battle the soldier knows not fear. Indeed, he welcomes with passionate ardor the wild charge. Here is not so much calm courage which is in evidence, but rather the reversion to primitive and basic blood frenzy, in which fear has no place. It is when death cannot be anticipated, coming upon one vaguely, from a quarter one knows not where, that the fear of it affects the bravest. For instance, when I was a cavalry officer in the Seventy war, my fellows and I would be encircling a camp fire; we would be smoking, chatting and sipping our coffee, when suddednly the blood of one among us would be spattered upon his coffee cup and his quivering body would fall prone, stricken by a cowardly sharpshooter's bullet. There were no braver men than we; but at such times there were none among us whose faces were not blanched with fear. No, my comrades (that was his term for all worthy men), the thing one feels under such stress is not what you call nervousness; many military men say it is that. But it is the duty of the soldier first of all to be truthful; let us then use the right word. In such moments there comes upon the hardest a great fear of death, of dissolution, of annihilation."

"I am thinking, said the doctor, "of a case of serene heroism in which fear had no part, of calm anticipation of certain death, the moment of which could not, however, be assured. There walked into the hospital where I serve a negro, not much over thirty, having the soft, musical voice of his people, a smile that would make you, knowing his sure fate, choke to see, and an ashy-gray hue upon his dark face. He bared his breast, from which a tumor protruded the size of

a cocoanut cut in half; the sharp, stabbing pain of which he complained indicated how the aneurism was eating through his ribs and breastbone; the veins about his chest were engorged; one could see the heaving expansive pulsation; the humming *bruit* could be heard as well as felt. He was at once put to bed, where good physicians and kindly nurses could be with him constantly. I was relieved he did not ask me what his chances were; indeed he knew as well as I as to that. Next day I visited him. His wife had come with a prattling picanniny who was trying to play with him, and could not understand why it was being thwarted and held back. But sitting up had been absolutely interdicted the father for fear of a strain; and the mother had to suppress this absurd little creature as best she could. I had never quite known the meaning of the word resignation until, in these circumstances, I contemplated the quiet, yearning face of this suffering negro. A few nights after, while a nurse was watching him, he suddenly gasped, his whole body was gripped for a moment in a mighty convulsion, and then he turned flaccid upon his back. The death was merciful; for the aneurism had ruptured while he slept.

And then they joined the ladies, one of whom was extolling a society formed by elderly maiden ladies for the protection of cats; so that wicked small boys might not hurt their felines; and by way of conservation against those cruel doctors, who were vivisectioning cats under the base pretence of benefiting humankind!

WOMAN'S SEVEN AGES.

Everyone knows all about Shakespeare's "Seven Ages of Man" speech in that most entrancing of all human comedies, wherein Orlando vanquished more than his enemies, as Rosalind so exquisitely admitted. But, far as I know, the *seven ages of woman* have not yet been written up. And I am going to make a try at the theme, after Shakespeare—a long way after The Thousand-Souled. And from the doctor's viewpoint.

The first age of woman is of course that of the girl baby. Naturally the best thing about any baby is to be well born—eugenized, we would say nowadays. Not necessarily of blue blood (which, in the physical sense at least, is impure blood), but fine-minded and fine-bodied, no matter whether the spoon in the mouth be of silver or of pewter. And as a matter of fact most of us are well born. You may recall Dr. Oliver Wendell Holmes' bull that "one should be careful in the selection of one's ancestors." Of course there can be no choice here; and equally of course most of us couldn't imagine a better parentage than the one we are blessed with. After all only a small minority are not as well born as might be desirable. There are children born with dreadful disease tendencies, even with diseases—a sad heritage indeed. And yet for even these the right environment and the right care after birth are a wonderful rectifier. Some indeed would say, with Ko-Ko, that

heredity "has nothing at all to do with the case," that environment is everything; but they are extremists, for a good heredity is not to be decried.

And here comes the factor of imitation. I talked recently with an orthodontist—one of those tooth-straighteners. He was for having it that heredity has very little to do with queer features and homely jaws and crooked teeth. I reminded him that families through many generations are known to have family characteristics—the famous Habsburg chin, for example, which is as typical in the present King of Spain as it was in Philip the Second several centuries ago. There is a book on that subject which gives many portraits of men and women in that Habsburg family, every one of them big-chinned. But my jaw-manipulator friend rejoined that my instance proved nothing, that imitation was here at work, and not heredity. What infant, seeing big-chinned people about it, would not exercise its basic faculty of imitation, would not be constantly working its plastic baby chin, so as to have it correspond with the biologic chin-scheme constantly presented for its observation and becoming part and parcel of its experience. Give a baby a bull dog for a companion, and it will sit for hours trying to imitate the ugly jaw of its pet. The same with the Teddy-bear, which is so perverse a substitute for the girl baby's doll. May not that child in time look bear-like and act so, too, becoming afterward an unbearable woman, of the sort a trifle too frequent nowadays.

Well, if my orthodontist friend is right as to facial expression, may not his view be equally valid for the thousand and one things babies are supposed to be born with. Recall the vaudeville joke. Says Jones: "I have a lovely baby; folks say it looks just like me."

Rejoins Smith: "Oh, I shouldn't worry; maybe she'll outgrow it."

And as to the science of eugenics. It is a science which promises to do a lot of good. But remember that nature devised eugenics long before our time. Darwin expressed this universal phenomenon in his law of the survival of the fittest. By far the most of our parents have mated well, simply because they have fallen helplessly in love with one another, under nature's wonderful and generally benignant influence. "Falling in love" is a beautiful and romantic phrase, the scientific equivalent of which is natural selection. We are now having eugenics contests, "for better babies," which, as a newspaper headline puts it, are "picked for their brawn." There are "perfect scores" prepared, the items being height; weight, circumference of chest and abdomen, shape of ears, bones of skull, cheek limbs, feet, quality of muscles, and so on. The whole reads like these pugilism schedules prepared for the bettor who may thus be put in a position to know whether to put his money on the Harlem Spider or the Bowery Coffee-cooler. In the baby score before me only six per cent. is for disposition and ten per cent. for facial expression. That is to say, the psychic factor in eugenics is here greatly minimized. For my part I maintain the psychic—the spiritual factor is pretty much the whole thing. The test of good birth in a child is the noble souls of its parents; that obtaining, the right physique will pretty generally follow. I believe such sentiments as this of Elizabethan Spencer ought to be hammered into people these materialistic days:

**"For of the soul the body form doth take,
Since soul is form; and doth the body make."**

II.

"Give a child in my keeping up its sixth year; and though you may then take it from me forever, and I may never see its face again, it will yet throughout its life abide steadfast by the training I have given it." If the religious teacher who spoke thus had doubled this formative period, it would surely not depart from the path laid out for it in that dozen years. I believe the principle is tremendous, and most important of consideration in this twentieth century chaos of a civilization, when all evil is supposed to be avoided and rectified by means of laws rather than through reverence for the home and the family ideal. The first dozen years are the most impressionable in existence; which means that the child's destiny is developed nowhere else than in the home; and that it were well-nigh hopeless to assure its right development anywhere else.

Of course the school and the religious teacher must play their adjuvant part. Childhood is the formative period, both for mind and body. The ancients were insistent on the sane mind in the sound body; and we of to-day fully recognize how right they were. It is superb, the things that are done nowadays to assure the health of our school children. And many of the schools that are now building are marvels for healthfulness and sanitation. I have read of a little girl whose mother was combing her hair with a rubber comb in the gloaming of rather a cool evening; there came sparks from those curls in the process. She asked her mother how those sparks came. And her mother answered that they were electricity from her hair. "That's funny,"

she observed, "here I've got electricity in my hair, and grandma's got gas in her stomach." We have certainly got past the gas age mature people remember; and into a very truly electric age in education. (By the way, they have even been talking of electrifying school children at their studies, by having currents in the walls of the school room; they might better electrocute them than do that.)

It is essential to develop the child's imagination or at least to educate and direct this faculty to the end that the ideal shall ever be for it the real in life. Consider how rich it makes the child; it doesn't have to have millions, for it will then enjoy all that millions can bring—and much more. The wonderful books that are written for children, the fairy tales, the flowers in our parks, the folk dancing (in Hellas dancing, besides being a pleasure, was so important a factor in life that it was a part of religious service), the calisthenics children go through, the exquisite poise and sense of form and rhythm which are got from the music of the old masters (Papa Haydn and the child-natured Mozart), seeing the comedies of Shakespeare and others (by which many a tenement little girl acquires the charm and graces of a gentlewoman). What matter limed walls, kitchen chairs and pressed crockery to the child that can by imagination acquire taste and a gentlewomanly disposition. Lafcadio Hearn gave us his exquisite presentments of Japanese life before he visited that land; it was mostly in his imagination any way, for he could see with his physical eye almost not at all, poor fellow! And the Laird in "Trilby" painted superb pictures of Arabian life out of his imagination; but after he visited Algiers and really saw these places his pictures of them were atrocious. How pauce are

oftentimes real things by comparison with the ideals of them that are cherished.

III

There are two paintings I long ago, in my mind's eye, placed side by side, by reason that they glorify each a complemental phase in human life—man's and woman's third stage. They are both very familiar picture; and the reader will at once recognize my sketch of them. They have to do with early manhood ("the lover sighing like furnace") and maidenhood, when poetry, music, flowers, perfumes, sunshine and the theretofore latent instinct to love and power to inspire love are gloriously dominant; when sentiments ring true; when there is (as yet) never a thought of subordinating ideals to considerations of worldly interest.

The one of these pictures is called "The Soul's Awakening." I don't know whether Zant, the painter, named it thus. Perhaps it is in this respect like the moonlight sonata or the Spring Song, to neither of which Beethoven or Mendelssohn gave those titles. Anyway Zant's painting is to my mind wonderfully well entitled. We see a very young girl, whose family and friends have but a little while before been done with speaking of her as a child; she is now a woman, but she has thus far hardly passed through the gateway into that marvelous field. Its strangeness and its wonders are very new to her and very entrancing. Clearly she has entered on ways most lovely, such a field as she dreamed of in childhood; in her little-girl day musings there have been vague foreshadowings of its beauty and its comfortableness. But her dreams never reached the realization now vouchsafed her.

Yet even with her still tremulous hand (tremulous as the body of a little bird) on the gate, she can comprehend that in all things good and pleasurable there must come responsibilities and cares as yet uncomprehended. And although she has no fear, courageous emotions are certainly aroused in her. And now too, she finds the life into which she has come to be stimulative of faith and truth in the Power that has prepared and ordered this field for her indwelling throughout the remainder of her existence.

In Zant's epic portrayal the courage and the trust lie mostly in the eyes, which are large and clear and liquid and deep and very frank; in them all the fearlessness that will be needed are to be found. Then besides the eyes, that superb painter has presented a most ingratiating and winsome face, and this with infinitely gentle touch. And the as yet immature figure is exquisitely portrayed; and last of all the luxuriant hair caressing tenderly the head and the shoulders. What poet's heart this Zant must have; and what a veritable seer he must be, to be able to grasp as he does the innermost, the fundamental in life.

The other paintings in my mind is Abbey's Sir Galahad, whose ideal was

"To love one maid only, cleave to her,
And worship her by years of noble deeds."

But this, as Kipling would say, is another story, not here to be dilated on.

IV

For this stage Shakespeare represented man as "seeking the bubble reputation, even at the cannon's mouth;" he comes now upon the time to fight the world's battles

(how futile so many of them are), to do the world's work. For the woman it is the time of wifedom and motherhood; and hers is indeed the harder part. The life of man is glory, the life of woman is love.

“For men must work, and women must weep,
Thus runs the world away.”

And here, quite absurdly, a practical idea enters my matter of fact, professional head; it is a descent indeed, from the sublime to the ridiculous: The most important thing for bringing babies triumphantly to weaning is the right kind of milk; if they get that their tummies won't be behaving so badly (mewling and so on, in the nurse's arms, as Shakespeare graphically but rather inelegantly put it.) The best kind of infant's food is that which is drawn from its dear mother's breast; practically all the digestive disturbances of infancy (oftentimes fatal as they are) do not trouble breast fed infants. Of course some mothers are incapacitated by illness or weakness from giving their babies this natural nutriment; and, sad to tell, there are some mothers so rebellious of this blessed function that they consider the demands of fashion and of society superior to it, worthier and paramount. Thus, for one reason or another, many babies have to be bottle fed; so that the science of infant feeding by modified cow's milk has been developed.

And here is a grotesque notion. Next after the ambition to portray adequately the countenance of The Christ the painter has striven to present The Madonna and Her Child. In the former essay almost all have failed, in the latter not a few have succeeded. And we have many beautiful, sympathetic and precious canvasses and marbles of the mother and her infant. But

what would you think of a madonna, instead of giving her sacred breast, pictured as feeding her babe out of a bottle labeled "percentaged, lime-water, Pasteurized cow's milk?"

A mother who fed her baby thus (perhaps through no fault of her own) or had the nurse to do it in her stead, bewailed her baby's death to a great physician; "it had pleased Providence," she said, "to take her baby from her." The doctor told her she had no right laying the fault on Providence. Providence had had nothing at all to do with the matter. It was bad milk that killed her infant—bad milk, for which humankind and not the Deity, is blameworthy.

And now about another picture. Everybody has seen it in print shops. It represents a young mother of the poor, clad in a cheap shawl, weeping over the corpse of her first born. I have seen that picture in the very life—and death; and the memory sometimes haunts me. It was in a squalid tenement. There was nothing in the room save a kitchen table on which the dead baby lay, and the rickety chair in which the mother sat. Absolutely nothing else; it looked like an eviction for rent unpaid—though I don't know as to that.

I had knocked several times at the door, and had received no answer. Then I went in. Just as in the picture sat the mother, hugging that rigid little body, with its baby head so endearingly shaped; constantly kissing its thin waxen hands; crying convulsively, so that the tears kept running down her cheeks; whilst she talked to, even crooned to, the little creature she had borne and had so willingly suffered for; cuddling it to her breast and begging it to smile the way she had coaxed it to in life; doing the things mothers love to do with their infants. All the tragedies of the ancient

Greeks, and all others imagined since, paled after that one before me, whilst I stood speechless and reverential and—to speak truthfully—frightened. For here was the most awful, the most epic, the profoundest of all human tragedies.

V.

We come now to what is in man really the noblest and superbest age—that of his maturity. For women it is no less noble than any other; but as certainly it is the most difficult of them all.

I once knew, professionally in the beginning, a lady who believed in mind cure; and the reason she wanted my ministrations and my prescriptions was that she was not then so strong in faith as she was going to be later. It was only a matter of time when her faith would become so strong that she would not need doctors and medicines. She had had, before calling on me, a nervous affection. Several years ago she lived in a low-lying city by a vast body of water; her doctor there advised her to go for relief into a dry equable climate of some altitude. This she did and soon became well. Shortly after her arrival there she came upon some Christian Scientists who interested her in their cult—and presently began to attribute her return to health to their influence; finally she became one of them. Soon afterwards she came to New York to live; in this trying climate her symptoms returned and were not alleviated by the "healers." She then dropped that cult for reasons which need not here be detailed. Then she took up theosophy, in which she presently found some objectionable features. Following upon this she took up and in turn discarded mental science, spiritualism,

new thought, and what not else. On the occasion of her last call on me she began very buoyantly to entertain me with an account of a "splendid" lecture she had attended by one "Professor" Blank. This lecture had so appealed to her that she had decided to attend a course which had been arranged; and had already paid in advance—as required.

Now, according to the professor, everything goes by vibrations. The explanation of the nature of these vibrations seems to have been omitted from that precious course of lectures. Health and happiness lay entirely in keeping harmonious with these vibrations; and by the end of the course the way how to achieve this harmony would dawn in fullest illumination upon you. It was explained in the first lecture that the lecturer had himself been a Christian Scientist, a new thoughter, and an adherent of several other like systems; but one after another they had seemed so strange and eccentric and *unreasonable* (amazing how your Paracelsian loves that word), that one after the other he had lost faith in them. But now he had himself, through prolonged Nirvana-like abstraction, come upon the right idea. He was the man for your money (though he didn't of course put it that way); and if you valued health or happiness you were by all means to keep clear of that shop across the way, or any other.

Now all this seemed, in that poor lady's narration, so absurd to me that my face presently broadened into a smile—which was at once checked by her saying very piteously: "Why, oh why are you laughing at me?" And then she fell to weeping.

Indeed, and in very truth, it was no laughing matter. She surely felt conscious of a lack of dignity and of normal womanliness; her nature must have been per-

meated (subconsciously no doubt, except at such moments as this), with the knowledge that her philosophy of life was absurd. But she had now come to be like a man that had been fighting continuously against the unfairest kind of odds; knocked down, he jumps up to continue the struggle, and is again worsted; after many such encounters a sort of inertia is inevitable by which no kind of fight can be put up as obtained in the beginning. And so this gentlewoman had now come to be afflicted with a psychic inertia, which rendered her incapable of rising above and freeing herself of abnormalities. The whole trouble probably originated like this: She was past forty and she had not married. Now, there are many superb women who have not married, and for reasons all sufficient for them. But this does not obviate the fact that such singleness is not the best state at all, but is the greatest pity in the universe. As for my poor friend, she was extremely charming; and if any woman had ever been born for wifehood it was she. Had she so elected she would have made some one among the many she had known a hopeless, irretrievable optimist for the rest of his days. She had chosen instead to be a "bachelor girl," like so many foolish women nowadays; she had deliberately set aside her manifest destiny. And what kind of a miserable alternative was hers!

I have written at greater length than I had intended; and can only in a few words state that in this example is to be found the germ of so much of the chaos in which we are existing (not living at all) these days. Herein is to be found the genesis of the suffragette, the feminist, the man hater, the divorcee, the woman who would rather pet animals than love children, she who so ineptly rails at fate, the female Prometheus.

It is a dreadful thing indeed how frequently the ideal of the family and of the home which are the foundation and the keystone of all civilization, of all refinements, of all human relations, of all hopes, of human advancement from savagery, should be most subverted by those who ought, for their own security, to be the most jealous supporters of this ideal.

And as for mere man; why, bless you, that sex isn't nearly so bad as it seems. It certainly doesn't deserve to have its face scratched—leastwise, not as a sex.

VI

In my youth I had the blessing good fortune to know an elderly gentlewoman, now since gone to her sure reward. It would be difficult to imagine anybody more necessary to her kin, her friends, or to the community in which she lived. No family matter, whether the engagement of a granddaughter, or the starting in business of the boy of him who had married her niece's husband's second cousin, was ever concluded without her interest being solicited. Any friend who had ever sat at her table or had drunk a cup of tea under her roof, might claim consideration almost as warm as for those actually of the blood, or who had married into it. And a made man was that tradesman who could deliver his goods at her basement door. Her home, I must be careful to add, was in that elysium about Washington Square Park, in the Metropolis.

Now, ordinarily, people are apt to drop in to tea of Sunday evenings—high tea—and welcome. But this dear lady had high tea every evening. Youngsters would come in the late afternoon, and have their heart-

agonies soothed by her. And girls would "just drop in" and be amazed to find there sundry boys whom they could never have imagined would happen there precisely at that time—oh, dear no! The old, the young, men and women, with little children, would call; and generally would stay to tea. The men who came seemed to appear from all over the habitable globe. She was the widow of an Englishman who had been in the navy; wherefore men who had travelled much were to be seen there. And certainly no one of them who ever touched at the port of New York would dream of missing this snug haven. And what extraordinary little presents they were constantly bringing; the house seemed full of them: Tea, made of real tea leaves, from China; horrendous Japanese idols; amulets from India; perfumes from Araby; laces from Ireland; flowers always.

Truly you thought of Browning's tender bit of flattery that "the young women are beautiful, but the old women are still more beautiful," when you were in the presence of this genial, satisfied, satisfying hostess; seated at the head of her mahogany; clad simply in amply-draped, soft black silk, with old lace about the neck and at the wrists, the dress slightly opened at the neck and filled in with that fluffy kind of stuff which I understand is called tulle, an old time brooch (some family heirloom) pinned to and resting upon it.

No table cloth on the mahogany, of course; but superb silver, sparkling glass and wonderful chinaware, with a bowl of flowers in the centre of that polished wood. Your moral tone (I speak of course only of men) was jacked up many a peg, whilst you masticated veal loaf and salad, home made preserves and cake; and you imbibed of the cup that cheers, conversing through-

out with the fortunate company gathered there, in the benign effulgence radiating from the head of the table.

Lagging superfluous on the stage? Well, hardly. Ah, how we have since been missing her!

VII.

"Last scene of all," the justified mother of men, who rests in her armchair on the porch, surrounded by her comforting children and her children's children, whilst the rays of the setting sun touch warmly her whitened hair. Serene she sits, her eyes steadfast upon the west-erly glow, as the twilight gathers, and the evening star appears, musing of many things in the past, but mostly of memorials dearly treasures and fondly laid aside in some old cabinet.

"Her hallowed bridal dress,
Her little dainty gloves,
Her withered flowers, her faded tress."

Brillat-Savarin had an aunt with whom he felt a mutual and very warm affection. When past her ninetieth year he was summoned to her bedside. He brought with him some of his best and most restorative wine. He most gently raised her head and induced her to take some of this good wine. She thanked him, and sinking back contentedly on her pillow, said to him, "My dear, should you come to my years, you will understand that the aged need death just as the young need sleep."

LET US GO OUT INTO THE SUNSHINE

It seems like harking back to another generation to have read that President Finley, of the College of the City of New York, did his thirty miles in nine hours—in the night time, too, when pretty much everybody was asleep. He began his jaunt with Elizabeth, New Jersey, and ended up in Princeton for breakfast. A fine example for his students; and one that could have been set only by a man sound in body and mind; one much too rare in these days of trolleys and motors.

Samuel Johnson tramped through the Hebrides, for all his scrofula. Ollie Goldsmith was for years a way-farer throughout Europe. Mark Twain tramped abroad—whenever he couldn't "get a hitch" or take a boat. Blaikie, in his immortal book on "How to Get Strong and How to Stay So," in the last of many editions, as well as in the first, maintained the best of all exercises to be walking.

"Give me," enthused Hazlitt, "the clear, blue sky over my head, and the green turf beneath my feet, a winding road before me and a three hours' march; and then to thinking." Whereat Stevenson: "And he must have a winding road, the epicure." Poor, sick Robert Louis, who could appreciate, but could not enjoy, such gratification.

In other generations men thought nothing of thirty miles. For Dickens it would have been just a fresher, a regular morning exercise—just one hearty meal of

fresh air. Lily Langtry, in her prime, frequently did her twenty miles a day; no wonder she was handsome.

Nor is that wonderful old bishop to be forgotten who died now some two years ago, at three score and ten; and who regularly spent a fortnight's vacation for many years in tramping—through the Shenandoah valley one summer, somewhere in Virginia the next. He loved for a season at least to become a simple wayfarer. Being anxious to know intimately his Master's own people, he slept at night in the homes of poor workmen, got their points of view, sympathized with them, mended their clocks (he was amazingly dexterous at such handiwork—for a clergyman), admired their pigs, and told their children stories. And they, for their part, not at all realizing the huge enjoyment and benefit he was getting out of it all, pitied that poor, old white-haired man, with the long, flowing beard, who journeyed a-foot, since seemingly he had not the wherewithal to travel any other way.

Especially should walking entice those who work mostly with their brains. The season is now on. The clear sky, the bracing breeze, the rustling boughs, the murmuring waters, the birds, their throats simply bursting with melody—these our brethren, which should be our familiars, are calling; let us go forth and walk. Select little-frequented roads, as free as possible from "devil wagons."

But take some precautions: Be very careful not to overtax the strength in the beginning; in walking as in everything else, one must avoid extremes. Radical changes are not without danger when abruptly made. The desk or the office in the city is an altogether other environment than the woods.

GET WHOLESOMELY TIRED

In going for a day's walk, on a Sunday or a holiday, there is no harm in getting stiff and wholesomely tired; a warm bath at bedtime will set that right. But when the trip is to be extensive—as for a fortnight—the man-machine must not be overtaxed at the start. No more than five miles the first day; ten the next; fifteen or so the third. And then you may begin at daybreak and walk until you are canopied by the stars; and even were that day the twenty-first of June, no harm will come of it, but much good and happiness.

The way to walk is to throw back your shoulders, military fashion—the chest out, the pectorals expanding, the nostrils dilated with the fragrance of all outdoors, the lips closed, the head erect. The arms to swing half-way, not like a windmill. Have your mind diverted by the everchanging scenery; there is nothing else that will so surely get the cobwebs out of the brain.

This simple, primeval exercise is preferable to any other, in that it is not necessarily in the contestant class of athletics. No preparations (except as I have stated) are needed to be in prime for it. And in other sports—boxing, tennis and the like—what men do not become slower in their movements after thirty? Who, even the most expert, could, after fifty, think of competing with young men in them? Nor is there any better way than walking tours for middle-aged gentlemen to dissipate an undistributed middle, and to restore the belt line to its normal.

Very little paraphernalia is required; certainly little if you are going for the day only. A stout easy pair of shoes are essential—such as have been tried out a

week or so beforehand; and the feet must be well bathed and nursed (vaselined, if necessary) at the end of the day, so that they will not be tender. Many a walking trip has gone to pieces the first day or two by reason of blistered feet. Talcum powder is to be dusted in the shoe if there has been perspiration.

A good wayfarer, who is not too fussy, and of reasonably democratic tendencies, can find a good lunching place anywhere along the road. Some very pleasant recollections of my own are of my seat on any convenient barrel in the country store, crackers and cheese in one hand, a glass of ginger ale or cider in the other; and a discussion of the perversities of our political system with the village coterie. Hotels great and small, magnificent and modest (the latter generally the more comfortable) are never lacking.

A cake of chocolate in the pocket will never be amiss. This is a most sustaining food. I understand that German soldiers on forced marches are rationed with it. Weston ate often in his walks; an egg beaten up in a cup of hot coffee was a favorite refreshment. As often as he hungered he ate—I presume a little at a time; for such energy as he displayed disposed rapidly of tissue waste, which had as rapidly to be replaced. That is what we are after in a walking vacation—to renew our bodies, to get rid of the sluggishness stored up through months of sedentary occupation; and to get rejuvenated, or better still, born again. Throughout Weston's last walk from the Atlantic to the Pacific he lost but eighteen pounds. And when he felt drowsy he ate; and this, he declared, restored him and banished sleep. Here, however, the amateur should not imitate him.

As to companions on the walk: A party is usually congenial; because if you are bored by one member, you can easily find another more in keeping with your temperament. In a party you will always find your man—of either sex. But if you are to have one companion be sure he's agreeable; otherwise there is no torture so exquisite as a day's walk in his company. Not only does he make you suffer on his own account, but you lose all the other pleasures into the bargain. If you are not absolutely sure of your man, go alone; you will be surprised what a good fellow you will then become acquainted with! Don't wait to get your own experience about this; take mine. (This, reader, is strictly *entre nous*; and I had rather it wouldn't go further.) Remember that walk which Anstey and another took on the Cader Idris in Wales? After the first hour they began to be bored with each other; then they got offensive, then sardonic, then insulting, and finally fit for any crime, as for instance: "Do you know why you remind me of this mountain?" said Anstey. "No, why?" returned his companion. "Because you're a cad awry dressed."

DISCOVERIES FOR ALL

Every one will surely find, in a little search, delightful walks in his own vicinity. I give you here my own discoveries around our greatest of cities. The Metropolis is supposed by many to be a sort of colossal prison, where one is doomed to spend the most of his years in canyon-like streets, with never a hope of rural delights. Not at all so. Suburban New York has truly Olympian happiness for the man who is good for from ten to twenty miles before nightfall. Within half an hour's ride one might imagine himself in the heart of the Berk-

shires. In Westchester County there are Grey Oaks, Hastings, Scarborough, Dobb's Ferry, Irvington, Sleepy Hollow, Tarrytown, to be visited afoot. Walk from White Plains to Mt. Kisco; and Central Valley, for a longer trip, from Newburg (to which place the "Albany Day Boat" takes you) to Suffern. Or from Suffern to Greenwood Lake, thence to Lake Hopatcong, and back to Suffern, if you like; or from Newburg to Port Jervis, thence along down the Delaware to the Water Gap and so home; or from Nyack to Rockland Lake. For the tramp along the Palisades from Fort Lee to Nyack no other word than magnificent is fit; and what a climax is that sail across the Tappan Zee in the twilight, with the train to take one home in the evening!

Or for an afternoon's outing, take the trolley to Prospect Park in Brooklyn; walk thence along the park until you reach the Ocean Driveway; and so, continuing afoot, with the briny air in your face to Coney Island; then, if you are not yet satiated, return by way of Cropsey Avenue to Fort Hamilton, and to the Brooklyn end of the 89th Street Ferry. "And so home," as Pepys would say. Or take the trolley to Jamaica and start in any direction, for Long Beach (this is indeed superb), or for Garden City. Or go from Flushing to Lawrence and thence to Rockaway, and by trolley home.

But I would give you now the *bonne bouche* of the feast—a week in latter September or early October: I boarded the *Mary Powell* which took me through the Hudson in the late afternoon and the twilight to Roundout; then I trollied to Kingston where I slept for the night. Next morning I returned to Roundout, ferried to Rhinecliff and then on my shoes to Pine Plains—

twenty miles. More than I should have gone, and breaking my own rules. But the air was crisp, the road level and excellent and the scenery soul-filling; and so I was just porcine that day. Thence after breakfast to Lakeville where I lunched; and so on to Falls Village, Connecticut, where I lodged with a friend. Then began a veritable jog of joy, through the Berkshires to Bennington, Vermont. I trolled back to Canaan, Conn. Then I gave a day to a triangle from Canaan to Norfolk, and thence over Norfolk mountain (*Helicarnassus*, I am sure, has nothing on that mountain, nor on the plain below), back to Falls Village, where I revisited my friend for a night.

I did not know then what hallowed feet had preceded mine; but many years ago, when walking was more the vogue—and men brawnier, I can't help thinking—Senator Hoar and Horace Gray walked over much of this territory.

I recently discovered the fact in Hoar's Autobiography: "We started from Greenfield and walked over the Hoosac Mountain to Adams and Williamstown, then over the old road to Pittsfield, then to Stockbridge, Great Barrington and the summit of Mt. Washington now better known as Mt. Everett or Taghconic; thence to Bashpish Falls in New York, and to the Salisbury Lakes in Connecticut." Be sure to get the book and read (p. 876 vol. II) what a dream of a time they had, how they met Josh Billings, and so on.

Well, then, leaving my friend at Falls Village, I made for Litchfield over Goshen Mountain, to Watertown, and so for the last day, by trolley to New Haven and along the Sound back to the Metropolis.

SENSE TRAINING

To one ambitious of leading the scientific life, sense training is from the beginning most essential. "Seeing is believing," but the belief thus founded may not be rational. Seeing, reviewed and, if necessary, revised by the reasoning faculty, will then be soundly based. Only from such process can facts be born—facts, the sole building material with which science can work. The senses are by no means a sure guide; the very best they can do is to appreciate phenomena: that is, appearances. The stick appears broken in the pail of water; reason assures that it is not. Using a bright spoon for a mirror, one appears variously, as he holds the spoon inside or outside, or up and down, or sideways; but it is to be hoped one does not look any of those ways in reality. Cross the middle over the index finger; roll their tops over a bread pellet in the palm of the other hand, and the sense of touch will convey the impression of two pellets; but reason corrects the impression, and convinces us there is but one. Reason must ever bring judgment, memory and experience to bear upon the perceptions which the senses convey to the cerebrum; by these means reason must constantly be rectifying false sense.

It is amazing how frequently the imagination plays fast and loose with the sense functions—delusions, illusions and hallucinations being the result. Le Bon, in his fascinating book "The Crowd, a Study of the Popular Mind," tells of a crew shipwrecked upon a raft,

who kept eagerly scanning the horizon for a sail. After some days of watching one of these poor men, his psychism perturbed by his sufferings, being obsessed through desiring to see a rescuing ship, unquestionably saw something; and so desperate was the hope of his companions, that one and all agreed with him that the thing he pointed out was a vessel which could rescue them. When they came upon it, however, they found it but a tree which had evidently been uprooted and had gone adrift in an equatorial storm. Tuke, in his admirable book "The Influence of the Mind on the Body," relates how a boy who had on an afternoon seen a hanging, which had naturally much affected him, took a stroll along a country road in the evening of that dreadful day. He presently saw projected against the moon-lit sky the gibbet of the afternoon, and the criminal suspended from it. He ran home dreadfully frightened, to find that a cord dangling over the brim of his hat had by his overwrought imagination been metamorphosed into the aerial gallows.

Every reader will recall how he has in like manner been tricked by his senses. Hundreds of instances might be cited of delusions entertained by the unscientific, the unsophisticated, the highly emotional; people in whom such aberrations are not without excuse. We who pride ourselves upon our attainments in science are so prone to consider such delusions the exclusive property of geniuses, spiritualists, theosophists and other people whose imaginations tend to work overtime, that we feel distinctly humiliated to learn how men even eminent in science have been the victims of psychic perturbations. As, for instance, when the telephone was invented, a lecturer who was giving a public exhibition of the apparatus clearly and repeatedly heard the notes

of a trumpet which he had arranged to be played at the other end. He declared that he heard; nor need the record be doubted. Yet none of his audience could hear the trumpet; and for the all-sufficient reason that the trumpeter had made a mistake in the day, and was not in his place at all.

A very modern instance of "illusion caused by a species of auto-suggestion based on preconcerted ideas," is furnished by the episode of the N-rays, which all competent men now agree never had any existence at all. Professor Blondlot believed (in good faith, of course), that he discovered these rays at Nancy in 1908. He described them before the French Academy of Sciences, which body gave him a gold medal for his discovery.

Up to 1906, there were published one hundred and seventy-six original papers concerning these rays. Blondlot's observations were in turn confirmed by such well-known physicists as Charpentier and Becquerel. The N-rays were considered to be given off by almost all substances when in a state of strain; a tempered steel bar, Nernst lamp, and even a human nerve and muscle would emit them. The rather fanciful suggestion was advanced that if a certain radiation were given off by our bodies, according to their degree of activity, our thoughts might possibly be photographed: "thoughts being only brain rays." (Of course, the work within the last year of Drs. Kilner and Fielkin in London, as to the photographing of the "atmosphere" or the "aura" which the human body is considered to exhale, springs at once to mind.)

The N-rays, stated French investigators, could be reduced or removed by anaesthetics; a tempered steel bar, for that matter, could be chloroformed into quiescence. Following upon this the invitation came natural-

ly enough to men of science "to revise some of our notions on the difference between the organic and the inorganic." The N-rays were held to be even more wonderful than the X-rays or radium. Oddly enough, however, the N-rays did not, like the X-rays, affect either the spectroscope or photographic plates. Admittedly they were rather baffling and elusive, at least to those inexperienced in detecting them; but they had one physical effect upon which experimenters relied—their powers to intensify a light. A marked increase of luminosity was considered to be perceptible when an N-ray was directed upon a spark; or if a bar of tempered steel were held near a clock in a dark room, it was supposed to be possible to read the time.

As the months rolled by Blondlot's experiments were confirmed, and were even extended outside France. Yet many scientific men utterly failed from the first to observe any of the phenomena described. English and German investigators became particularly sceptical; and rather absurdly a dispute arose which, by the law of the crescendo in psychology, accrued progressively as to bitterness; compliments increased in warmth as they lost in polish. Things became quite akin to the immortal "Row upon the Stanislaus." Two camps were formed—the Latin and the Teutonic. The French imputed racial prejudice and animosity to their foreign critics. It was suggested that the rays could be distinguished only by the more sensitive and finer-fibred brain of the Latin; whilst what, *sacre bleu!* could be expected of the fog-muddled British brain, or of the beer-befuddled German psychism! The matter in dispute threatened to place itself beyond the bounds of any reasonable demonstration. Presently, however, the coolest French scientific men gradually came to suspect

that if no results could really be obtained in England or Germany, the explanation of the French experiments must be subjective and psychological rather than objective and physical.

Finally, the *Revue Scientifique* settled the question in a very simple way. It was proposed that several boxes of exactly similar appearance, some containing pieces of lead, others of tempered steel, should be sealed; and Blondlot or his assistants were to decide which of the boxes contained the active material. Blondlot refused this test, saying that "the phenomena were far too delicate for such a trial"; and he left "everyone to his own opinion on the N-rays, either from his own experiments, or from his confidence in others." Thus was the dispute transferred from the realm of fact to that of opinion, experimentation ceased, and so far as science is concerned the incident was closed.

Such incidents as these are rather humiliating to the scientific temperament, which, nowadays, is just a trifle inclined to self-satisfaction. Fortunately, they are extremely rare. Science is knowing; good science is ever certainly grounded upon demonstration. To this end the pre-requisite is the trained senses. Science's votaries, moreover, if they are to serve her well, must ever be free of auto-suggestions and haphazard conjectures incapable of verification.

EUGENICS

Francis Galton, the founder of eugenics, which he defined as "the study of the agencies under social control that may improve or impair the racial qualities of future generations, either physically or mentally," was himself singularly fortunate, both in his own heredity and in his way of life. The Galtons have been a superb Quaker stock through many generations; the grandmother of Francis was a descendent of Barclay, the apologist; Charles Darwin was his cousin; his mother, two brothers and two sisters at least, were nonogenations. At eighty-six he wrote: "I find old age thus far to be a very happy time on the condition of submitting frankly to its many limitations." The quotation is from *Memoirs of My Life* (Dutton), one of the most content-diffusing books in existence. (A digressive anecdote is irresistible. During an exploring expedition in Southwest Africa Galton visited the Ovampas. "I did much to make myself agreeable, investing King Nangoro with a big theatrical crown that I had bought in Drury Lane for some such purpose; but I have reason to believe that I deeply wounded his pride by rejecting the present he offered in return. His niece appeared in my tent, raddled with red ochre and butter, and as capable of leaving a mark on anything she touched as a well-inked printer's roller. I was dressed in my own well-pressed suit of white linen; so I had her ejected with scant ceremony.") These memoirs tell of an astonishing number of talented relatives continuing to the present generation, that of

Galton's grandchildren. His own psychic gifts were of the superlative order; his mental acumen was amazing, his vision extraordinarily broad. And his marriage was most haply, into a family hardly less remarkably than his own—the Butlers. And he naively wrote (presumably sometime after the honeymoon): "I protest against the opinion of those sentimental people who think that marriage concerns only the principles." Thus were his lines cast ever among all that has been and is best in English life. His fortune was altogether ample for the needs of so well-poised and philosophical a man. Especially did he enjoy association with the finest temperaments of his day—Maine, Kay, Hallam, Tom Taylor, Tom Hughes, Spencer, Huxley, Faraday, Tyndall, Gladstone, Burton, Pollack and scores of others.

It were difficult withal to conceive a man more saturated with loving kindness, more solicitous for human welfare; and this, indeed, is the spirit in which the eugenicist must work. The man who declared he would do nothing for posterity—"for what has posterity done for me"—would never have been able for to shine in the high eugenic line. And there is a kind of eugenics characterized by the lopping off of all save one of the rosebuds on a branch so that the one may become magnificent by absorbing the sap the others should have had; but that kind of eugenics had no place in Galton's scheme. He became enthusiastic to perpetuate his own Olympian status, nobly desirous that all humankind might become eugenized—well born, in the highest sense of the word—that there might come into being "races of highly gifted artists, saints, mathematicians, administrators, mechanicians" and the like.

Galton's mantle fell on Karl Pierson who both in lofty spirit and in good works has borne it exceeding

well. Pearson states Galton's opinion to have been that progress toward increased race efficiency is feasible by two routes: the scientific study of heredity and environment as they bear on race development; and a popular movement emphasizing the importance of these factors in national life and the urging of their right appreciation by legislators and social reformers. But to-day it would seem that, whilst travel by the former route is taking the safe and sober course characteristic of true science, travel by the latter is going by such breakneck speed as to invite sure disaster, and to be both disheartening and exasperating to those whose route is the scientific one. Indeed, the valid science of eugenics has as yet made but little headway; and Pearson has feared that before it has become matured and substantially progressive "the whole subject would be made ridiculous by the efforts of an uninstructed press to tickle the taste of a jaded public, with "eugenic" marriages, "eugenic" babies and "eugenic" plays, interviews with officials of eugenics societies—all of which has nothing whatever to do with the problem of race welfare. Eugenics, Pearson deplors, is rapidly developing into a topic for the poseur, the *Kongressbummler* and the paragraphist. Even eugenic publications and eugenic congresses are issuing statements demonstrably incorrect with regard to such vitally important topics as insanity, the mental defect or the influence of heredity and environment. Pearson considers that years of patient medicosocial observation, genetic experimentation and study of family histories are necessary before knowledge can be obtained on which to base conclusions as to any of those subjects. To-day one may state with dogmatism akin to that of the theologian the laws

of eugenics; but this cannot yet be done scientifically, that is, reasonably.

Pearson and his London colleagues reprehend such a dogma proclaimed in the name of eugenics as: "At last it is possible to give definite advice to those about to marry or those who do not wish to transmit their undesirable traits; weakness in any trait should marry strength in that trait, and strength may marry weakness;" and they "stand aghast" at the evil worked by the rapid popularization of eugenics, feeling certain that a movement thus "careless of its facts and vaunting in its conclusions must collapse."

Among the many zealous American workers in the "eugenic field" are those in the Carnegie Institution's Station for Experimental Evolution at Cold Spring Harbor, New York, of which Dr. Charles B. Davenport is the Director. Considerable important literature has thus far been given out from this Institution; (some of which, it must be noted, is adversely criticized by the London School we have just considered). Its Eugenics Record Office aims to be the country's clearing house for an investigation of race, of heredity, of blood lines; and it issues to all desiring it personal advice as to the suitability of prospective marriages, and the probabilities of inheritance. Thus far the data collected by this Office have been mainly of abnormal types; but this has been because such information has been easier to get. And here it should be noted that scientific eugenicists do not have to make experiments; our race is making them all the time and great many more than science needs for her observations. Some one wrote asking "if they were to have a farm up there in the woods and experiment on all sorts of freaks"; no, it was answered, such experiments are, melancholy

to relate, all too many of them constantly being made. Every child-bearing marriage is an experiment in eugenics, and there are as many experimental results as there are children born.

The collection of normal data has been difficult because many people have imagined eugenists to be interested only in imbeciles, degenerates, epileptics and the like; but Dr. Davenport aims to collect from whomsoever will send their names, information about normal individuals, the talented, the genius, the comparatively right-minded and the right-moraled; and he hopes, indeed, that the American citizen's idea of social duty will include the recording and depositing with the Record Office of full information about his genealogical tree. In brief, the work of this office is to learn how every characteristic behaves in heredity.

This Office is but three years old, yet thus far such facts as the following (which with all due deference to Pearson and his confreres we beg to set down, have been deduced): If two epileptics marry, their children will all be epileptics; the same is true of all imbeciles. If an epileptic or insane marries a normal individual, one-half or one-fourth of the progeny will usually inherit the parental abnormality; the others will probably be normal. A recessive trait (one present in undeveloped germ form and never becoming active in a given individual) may remain recessive for generations, but will very likely become active when it meets a like trait—recessive or not. The marriage of cousins is not bad in itself, if both families are of sound stock; but such marriage will naturally bring out any common traits and intensify weaknesses, recessive or otherwise.

Those of auburn tresses (if naturally so) are markedly antipathetic and seldom marry those having red

hair. A good environment strengthens good traits, but it will not guarantee the conquest of a bad inheritance. Love, in a mature and sensible human being (but who, however mature, has ever been sensible in such premises?) may be in itself a eugenic choice; the fact of two wholesome beings wishing to spend their lives together is like to be founded on instinctive traits that will make for a good inheritance, to be enjoyed by a normal posterity; but love offers practically no more than an even chance. (Nevertheless your thorough-going eugenicist, wise and mellow-natured man that he is, would not do away with love; he would preach no doctrine of scientific mating as opposed to the marriage of personal choice; but he would combine with love, if such a thing is possible, common sense and forethought.) Marriage with an individual of bad blood will tend to drag down the inheritance of good blood; imbecility is often introduced into "bloodlines" that have hitherto been good. One's inheritance cannot be judged by a consideration of the parents, for normal parents may have abnormal, even criminal children; the inheritance must be traced back for generations, and the records of cousins, uncles, aunts, brothers and sisters must be examined: one does not inherit from his parents, but from the family germ plasm.

Thus, the *bona fide* eugenicist would have love and the "eugenic principles" go auspiciously hand in hand in the marriage of the future, for happier homes and healthier children; and for the minimum of insanity, of hereditary degenerations, pauperism and crime. And succinctly, the object of the Eugenics Record Office at Cold Spring Harbor is to "serve eugenic interests in the capacity of a repository and clearing house; to build up an analytical index of the traits of American

families, to train field workers, to gather data, to co-operate with other institutions and with persons concerned with eugenic study; to investigate the manner of the inheritance of specific human traits; to promote and to aid in the organization of new centres for eugenic research and education; to advise concerning the eugenic fitness of proposed marriages, and to disseminate eugenic truth."

MEDICAL RESEARCH AND EDUCATION

It were good, as has been said, for every man to know something about law; it were even better for every man to know something about medical science. Indeed, next to philosophy, which is the gist of all the sciences, where is there one comprehending so many others, related so intimately to human life, entering into so many of the infinitely complex phases of civilization; what is there in human experience, from conception to the grave, alien to medical science?

The physician must know much of physics—the nature of heat, of electricity, of light, the mathematics of refraction, in order to get many of his beneficent results. Chemistry is ever medicine's handmaid. From mechanics does medicine derive, among much else, the principle of factors of safety, by which the body is enabled to bear the unusual strains of life, and to endure notwithstanding, to the end of man's allotted span. Architecture has found in anatomy the principle of the hollow pillar. What builder would proceed without consulting the hygienist and the sanitarian, for the help they can give in the manifold aspects of home life. What public work would be designed in defiance of the of the dictum that the health of the people is the supreme law. The biological sciences (how objurgated by some is that word science, which means absolutely nothing else in all the world than just "knowing")—those sciences are furnishing medicine most valuable and salutary data as to the vital phenomena of heredity, environment, function and will.

Do you imagine the physician and the painter have no bond? Examine, then, more carefully the next time you see them the Venus of Botticelli and the Blessed Damozel of Rosetti; and recall that the models from whom these men painted were consumptives. How shall you understand Nietzsche or Verlaine aright without knowing something of psychiatry. If you have not discerned pathology in literature, how toxemia coursing through the blood affects genius, read then again any page of poor tuberculous Robert Louis, or Lawrence Stearne or Marie Bashkirtseff; or hear again such eerie music as much of pathetic Chopin's, notably the First Polonaise. If you think melody has nothing to do with medicine, reflect upon the Dancing Manias of the Middle Ages and the Tango of to-day. Learn, too, of the hundreds—literally—of transcendent geniuses in literature and the arts, who have succumbed most untimely and most drearily, for them and for us, to The Captain of the Men of Death. Whereby the world has lost inestimable treasures of the soul and of the intellect.

Have the poet and the physician nothing in common? Read, then, from the book here under review:

"It is in the putting forth of the hypothesis that the true man of science shows the creative power which makes him and the poets brothers. His must be a sensitive soul, ready to vibrate to nature's touches. Before the dull eye of the ordinary mind facts pass one after the other in long procession, but pass without effect, awakening nothing. In the eye of the man of genius, be he poet or man of science, the same facts light up an illumination, in the one of beauty, in the other of truth; each possesses a responsive imagination. Such had Bernard, and the responses which in his youth

found expression in verses, in his maturer and trained mind took the form of scientific hypothesis." (Foster).

And this by Dr. Eliot, of Harvard:

"The imagination of Darwin, of Pasteur, for example, is as high and productive a form of imagination as that of Dante, or Goethe or even Shakespeare, if we regard the human uses which result from the exercise of imaginative powers; and mean by human uses not merely meat and drink, clothes and shelter, but also the satisfaction of mental and spiritual needs."

The physician must be a metaphysician also who would consider aright emotional epidemics, such as the Crusades, Witchcraft and the modern congeners of these phenomena. He will never have studied history aright who does not grasp (most historians have not) the part which pandemics of such diseases as Bubonic Plague, cholera, smallpox, malaria and the Great White Plague have played in human affairs. How oftentimes has medical jurisprudence served the ends of justice. Though the practice of theology and of medicine are to-day, fortunately, not often united in the individual, they are nevertheless as essentially complementary as they were in the stone age, when the offices of priest and physician were one. And the President-Emeritus of Harvard has told us that no religion is worthy the name which will not take sympathetic account of preventive medicine.

Consider, too, how horrendous a part syphilis plays in social life; that tuberculosis has ever been and is now one of the most dreadful economic degradations in civilization. And the highest statesmanship is seeing in preventive medicine a pillar of fire lighting the way to national happiness and the worthiest prosperity of peoples.

II

The universality of medical science is superbly demonstrated in the book *Medical Research and Education*, to which many among the most illustrious medical minds in America have contributed.* The spirit and purpose of this book are well indicated by Professor Richard M. Pearce:

“Wonderful as were the isolated achievements of the great discoveries in medicine in the early centuries, the great continuous advance in medicine during the past eighty years resulted from organized laboratory effort based on the principle of exact experimental methods; and it is the duty of the university so to organize its laboratories and hospital that this advance of medicine by research may continue, side by side with teaching, as a university function of benefit to students and faculty, as well as to the state and the general public welfare, and thus as an aid to the advancement of civilization.”

In this book one shall come upon English as masterly and as ingratiating as any to be found in literature;

**Medical Research and Education*, by Richard M. Pearce, The University of Pennsylvania; William H. Welch, W. H. Howell, Franklin P. Mall, Lewellys F. Barker, The Johns Hopkins University; Charles S. Minot, W. B. Cannon, W. T. Councilman, Theobald Smith, Harvard University; G. N. Stewart, Western Reserve University; C. M. Jackson, E. P. Lyon, University of Minnesota; James B. Herrick, Rush Medical College; John M. Dodson, University of Chicago; C. R. Bardeen, University of Wisconsin; W. Ophuls, Stanford University; Samuel J. Meltzer, Rockefeller Institute for Medical Research; James Ewing, Cornell University Medical College; W. W. Keen, Jefferson Medical College; Henry H. Donaldson, Wistar Institute of Anatomy; the late Christian A. Herter, Columbia University; the late Henry P. Bowditch, Harvard University. The Science Press, New York and Garrison, New York, 1913.

upon observations as pregnant as any to be found in philosophy. To quote:

"The human being is a part of the whole of nature and cannot be understood without it. What is wanted is a satisfactory general view of the process of the universe. Possessing this, we shall find the key in our hands which will open the most secret recesses of the art of medicine."—*Gomperz*.

"It is well that the sciences of nature hold out attractions to so many different types of mind, for the edifice of science is built of material which must be drawn from many sources. A quarry opened in the interest of one enriches all of these sciences. The deeper we can lay the foundations and penetrate into the nature of things, the closer are the workers drawn together, the clearer becomes their community of purpose, and the more significant to the welfare of mankind the upbuilding of natural knowledge."—*Welch*.

"Some day, perhaps, the mystery of life and being, which presses on the physiologist as on other men, and indeed, with a double weight, may be solved. Some day, perhaps, man may know not only *what* he is, but *why* he is. To-day, after but three thousand years of history and three hundred of science, it were indeed difficult to imagine how this can be so. We can only trust that it may be. Some far-off to-morrow may arrive, when the clearer vision of a million of years of science and of history may fathom the secret and read the reconcement of the hopes and the destinies of man.

"A hair, they say, divides the false and true;
Yes; and a single Alif were the clue;
Could you but find it, to the Treasure-house
And peradventure to the Master, too."

—*Stewart*.

"In the field of observation chance favors the prepared mind."—*Pearce, quoting Pasteur.*

"Remarkable achievements are never unique occurrences in nature. Even the greatest men rest on the shoulders of a large multitude of smaller ones who have preceded them; and epochal discoveries emerge out of a period of intellectual restlessness that affects many minds."—*Fleener.*

"Every citizen should be inspired with love of personal and public hygiene, as were the Greeks. Every physician should be deeply grounded in physiologic medicine and provided with proper facilities for using it practically. Every public health officer should know thoroughly the contributions of etiologic medicine. All efforts should be made to promote these fundamental needs of society."—*Bardeen.*

"The discoveries which have transformed the face of modern medicine have been in the field of infectious diseases, and in no other department of medicine could new knowledge have meant so much to mankind, for the infectious diseases have a significance to the race possessed by no other class of disease, and problems relating to their restraint are scarcely less social and economic than medical."—*Welch.*

"We cannot agree exactly on what a 'good doctor' is. Some will say 'Practical'; some will say 'Scientific'; some will say 'Knowledge'; some will say 'Heart.'"—*Lyon.* (The good doctor should be all of these).

"Wonderful as were the isolated achievements of the great discoverers in medicine in the early centuries, the great continuous advance in medicine during the past eighty years resulted from organized laboratory effort based on the principle of exact experimental methods; and it is the duty of the university so to organize

its laboratories and hospitals that this advance of medicine by research may continue, side by side with teaching, as a university function of benefit to students and faculty as well as to the state and the general public welfare, and thus be an aid to the advancement of civilization.”—*Pearce*.

“It is the privilege and duty of hospitals to extend their field of usefulness by opening their wards more freely to undergraduates in medicine, to elevate the standards of work done by nurses, internes, residents and attending staff, to foster research. By so doing they are not harming the patients, but are rather insuring them better and more skillful treatment. They are serving to enlighten and educate not only the individual, but the observing public as well, eager to learn and to be instructed in knowledge of medical matters.”—*Herrick*.

“He who purposes to study medicine should have in high degree three gifts, not one of which is common among mankind, yet all of which he must have: the power of reliable observation, intellectual endurance; loyalty.”—*Minot*.

“The die is cast, the book is written, to be read either now or by posterity, I care not which. It may well wait a century for a reader, as God has waited six thousand years for an observer.”—*Kepler*.

“We may regret the loss of many charming features which have been erased from the landscape of science by all of this minute specialization, of which no one can foresee the end, and such a sentiment is much the same and as unavailing as that for the return of the days of the stagecoach. The great instruments of progress in modern life—steam and electricity in the industries, subdivision of labor and increasing special-

ization in science—are not altogether lovely, but they are the conditions of advancement in material prosperity and natural knowledge.”—*Welch*.

“There is one quality the possession of which is the supreme need of the physician, without which he is as unfit and useless as a tone-deaf musician or a color blind painter; that is, the faculty of exact observation.”—*Minot*.

“Accurate observation is by far the most difficult art which mankind has ever essayed. A nation may count on furnishing abundance of military talent, plenty of politicians and statesmen, enough of competent lawyers; it may even hope to have gifted artists and authors; but it can scarcely expect to produce a single master of the art of observation in a century. In a century Germany produces one Helmholtz, France one Pasteur, England one Darwin—an American peer of these three is yet to become known.”—*Minot*.

“The most familiar sign of the public misconception is displayed in the effort of the daily press to furnish information on medical topics. With rare exceptions these efforts consist of sensationalism, personalities, wonder-tales, absurdities, and a general display of the haste and incompetence of the writer. Every medical article written for the public press should first be submitted to a competent medical expert for revision. More pernicious still is the influence of a score of semi-medical journals which cater to the taste for misinformation and absorb a large portion of the \$50,000,000 paid annually in this country in the advertisement of quack medicines.”—*Ewing*.

“I like to think of medicine in our day as an ever-broadening and deepening river, fed by the limpid streams of pure science. The river at its borders has

its eddies and currents, expressive of certain doubts and errors that fringe all progress; but it makes continuous advances on its way to the ocean of its destiny. Very gradual has been the progress of its widening and deepening, for it is a product of human ingenuity and artifice, and only skilled engineers could direct the isolated currents of science into the somewhat sluggish stream of medical utility."—*Hertter*.

III

Professor Pearce tells of six important activities in scientific medicine in the present day:

1. Immunity is the very basis of preventive medicine; it is one of the most fundamental properties of living things; by it untoward environmental agencies are repelled. *Immunology* (or serology) would explain and apply the mechanisms by which one's body is enabled to resist disease; and this science seeks to establish laws for the conditions determining natural resistance to infectious disease, and for the factors which increase or diminish this resistance.

Up to 1890 bacteriologists were studying almost entirely the causation of the germ—that is, the bacterial, the infectious diseases, and were attempting, with considerable success, to combat these diseases by means of vaccinations (still a most valuable proceeding). Since then, however, a new and ever-widening field of investigation has been opened, in which have been, and are being studied: the mode of action of invading germs and the mode of action of their products (toxins); the processes of infection and of intoxication; the mechanism by which the host combats the invasion and aborts or throws off such infection. Also it was found

that the toxins (poisons) generated by the bacteria produce not only an often fatal intoxication (toxemia); but that each toxin thus developed has its distinctive effect. The poison of each bacterium has its own peculiar and specific action. (For example, one does not contract any other disease than typhoid from the typhoid germ). Thus was begun the serum therapy through which were evolved the wonderfully beneficent diphtheria and tetanus antitoxins, and the impetus thus given has led to investigations of great and permanent value.

Among the bodily forces above indicated we can here mention only: phagocytosis, by which our white blood cells engage in a Homeric, though microcosmic battle with the invading bacteria, either engulfing, literally "eating 'em alive" (when the host recovers); or being themselves destroyed by the invaders (the host dying in consequence); the bacteriolytic (germ-destroying) properties in certain body fluids; the property in blood serum of agglutinating or clumping together pathogenic germs; the opsonins, those substances in blood serum (*opsono*, I cater to) which have the power to prepare bacteria for ingestion and digestion by the white blood cells. We must mention also the extension of Pasteur's principle of vaccination to protective (prophylactic) vaccinations against cholera, plague and typhoid fever; and the contribution in recent years to the list of curative sera of the antimeningococcus serum, used against cerebrospinal meningitis, a disease which heretofore has had a mortality of practically one hundred per cent. And as to the dreadful disease cancer, against which thus far the only hope is the knife, "no one of those most conversant with

the problem would be surprised to find to-morrow that it has been solved and that cancer is curable."

2. The bacteria are vegetable parasites; the protozoa are animal germs or parasites. Among the latter the essential causes of amoebic dysentery and malaria were discovered before 1890; since then fifteen diseases are known or suspected to be of protozoal origin. And *protozoology* has resulted in the discovery of the *role* mosquitoes play in the transmission of disease-germs; in the formerly pestilent Tropics being made habitable for the white man; in the achievement of Gorgas, without which the Panama Canal would never have been built.

3. "Our little Ehrlich" (that *dukkopf* who could or would not pass his exams and who was nearly flunked in consequence, but who instead busied himself with a most extraordinary variety of chemical compounds), has created a new science, *chemotherapy*, based on the principle that a specific chemical affinity exists between living cells and given chemical substances. Ehrlich believed that for each specific parasite a specific curative drug could and must be found. The destruction of germs, animal or vegetable, outside the body is a commonplace of surgical and public health measures; but the destruction of such germs within the living body has never, until Ehrlich accomplished it, been possible—not without at the same time destroying also, in part or in toto, the cells of the host. To avoid the latter it was necessary, therefore, that the protozoa-destroying substance should have a specific chemical affinity for the protozoa in question, but little or none for the cells of the host. Ehrlich's most brilliant successes thus far have been with Salvarsan, the 606th chemical combination with which he experimented in

the treatment of syphilis; and his arsenic compound (arsenophenylglysin) a single dose of which absolutely and permanently cures all animals suffering from trypanosomiasis (the sleeping sickness). There are now about a dozen drugs which can be used to cure or modify diseases caused by as many different protozoa. Wherefore chemotherapy promises results which (with serotherapy and vaccination for bacterial diseases) "will sharply limit the ravages of the transmissible diseases of man and animals."

4. The early *physiological chemistry* was largely the analysis of the chemical composition of various body tissues and fluids. This idea, however, soon gave way to a dynamic idea, that of function; and present-day investigators in this science are concerned chiefly with the ways and means of cell action. (All life, by the way, is essentially cellular; and all cells, from conception on, are derived from cells. *Omnis cellula e cellula*). The fundamental problems now engaging the workers in this field are (1) the chemical composition of the protein molecules; (2) the part played by ferments in the changes occurring within the living cell and which are responsible for the functions of the various organs and tissues; (3) the general problem of nutrition and the relative values of different foodstuffs; (4) the question of the interrelation of function—that is, of the influence of the secretion of the cells of an organ or tissue on the cells of a remote organ or tissue; (5) the mechanism, from a chemical point of view, of natural or acquired resistance to disease and of phenomena associated with such resistance.

5. *Experimental pharmacology or Pharmacodynamics* applies the methods of physiology and chemistry to the study of the action of drugs, poisons and

other substances which may alter normal function. This science includes not only the study of the mode of action of remedial agents in healthy individuals and the influence of such action on various abnormal conditions, but also, the effect of a great variety of substances, in short, of all animal, vegetable or mineral substances in any way capable of altering normal physiology. Nor is the study of the effect of these substances limited to man and the higher animals; but it includes the use of the lower invertebrate forms, bacteria and protozoa. It is, therefore, an all-inclusive branch of biology, dealing with the comparative study of the action of chemical bodies on animal life. Its achievements are of interest to physiology, to which science it has contributed much, both in method and in fact: to chemistry, in that pharmacology has added largely to the data concerning the interaction of cell and chemical substance; and to practical therapeutics, in that it presents new remedies, explains the action of old ones, and defines the limitations of drug therapy. And it has a definite relation to the general public welfare in that, by its methods, it establishes procedures for determining the potency of therapeutic remedies; thus preventing, on the one hand, ill effects from a drug of unusual power; and, on the other, guaranteeing a remedial agent of standard strength.

6. *Experimental Pathology and Pathological Physiology* are branches of pathology and physiology which, combining the methods of both those sciences with those of chemistry attempt, by the study of abnormal conditions experimentally produced, to explain the disturbance in function consequent upon cell or tissue injury or disturbances in physiological or chemical equilibrium. Co-ordinating as they do the methods

of several of the medical sciences and having for their object the elucidation of definite problems in clinical medicine, they are essentially the methods of a science of clinical medicine, and have added materially to the latter's advance.

EDITORIAL EFFUSIONS

HOW GENIUS MANIFESTS ITSELF

A great sculptor once had his soul so saturated with a wonderful sunset—its softness, its calm, its quiescent and gradual change of coloring and its peace-suffusing quality—that he wanted to portray it; but he was no painter. So instead he wrought in marble a little child asleep; and this he did so successfully that people contemplating the equanimity and trustfulness in its infant countenance, the stone that seemed almost to be respiring, declared that it put them in mind of a sunset and were bettered accordingly. So also fifty years ago a boat builder (this is imagined for the facts are not known nor do they in the least matter, since they “have nothing at all to do with the case”) was profoundly moved by a queenly, a soul compelling, and a good diffusing woman; but he was no poet and could not manifest his devotion in rhyme and rhythm. Yet his imperative ambition was to interpret his inspiration into something that might in turn benefit the world. So he built a poem: he designed a most beautiful white vessel with exquisitely graceful lines; and he named her the Mary Powell. And so transcendently delightful was that vessel, when outlined against the loveliest scenery in the world, so swift and sure her course along the noblest river, dashing the rainbowed spray from her bow, so benignant her existence, that these fifty years past people have never tired admiring her,

"many an eye has danced to see" her flag in the breeze; many a heart has throbbed at her passing, and from first to last men have called her, perfectly comprehending her designer's inspiration, The Queen of the Hudson. So from the beginning of the race have superb women moved men to glorious works; and never has such admiration been more justified than when translated into utilitarian achievements. The Mary Powell is going to the scrap heap! That is what it really amounts to, though her owners are trying to break it gently to the many thousands who love her and cherish memories of those with whom they spent hours on their runs. "She will make occasion trips." This, any discerning person can see, is but softening the blow. Soon she will pass away along with such gray heads as began their wedding trips on the sympathetic decks. But that is the appointed course for beautiful women and devoted men, and wonder-fashioned vessels, as well as for all and everything else in the cosmos.

THE HUMANNESSE OF SCIENTISTS

There is among many a misconception of the man of science as a morally and emotionally shriveled specimen who remorselessly sacrifices romance and poetry and human ties in crassly materialistic pursuits. The comparison of this misconception with the behavior of many typical scientists is distinctly ludicrous. Take, for example, the famous X Club.

This was essentially a dinner club; the members who attended its first meeting were Hirst, Spottiswoode,

*This matter has appeared in various journals. The editorial "we" is retained, rather than a change being made to the Teddy-veltian first person.

Tyndall, Frankland, Huxley, Hooker, Busk, Ayeubury, and Spencer. Later members were Darwin and many another of those amazing nineteenth century giants. "It has happened," observed Huxley, "that these cronies have developed into bigwigs of various kinds, and therefore the club has incidentally—I may say accidentally—a good deal of influence in the scientific world." Huxley once overheard two members of the Athenaeum: "I say, do you know anything about the X Club?" "Oh, I have heard of it." "What do they do?" "Well, they govern scientific affairs; and really, on the whole, they don't do it badly."

Nevertheless, a guest of this club must have been shocked and saddened by the frivolity obtaining among its members. There were no rules, save the unwritten law not to have any. But skeletal minutes were kept, as "Talked politics, scandal, and the three classes of witnesses; liars—damned liars, and experts." Excursions were organized for the members and their wives, as recorded by the algebraic notation " x 's plus y 'vs;" the " x 's" of the outings to be paid by the " x 's." It was suggested in the beginning to name this club the "Blastodermic," that being the part of the ovum in which the rudiments of future organism first appear; apparently " x " was decided on because it stood for the unknown quantity, and so committed the club and its members to nothing. In this coterie the observation of Herbert Spencer seems to have been lived up to: "It is a great mistake for adults, and especially those who work their brains much, to give up sports and games. The maxim on which I have acted is, be a boy as long as you can."

Among the reminiscences of Uncle Dan, a Harvard

man of the era when Hallis and Haleworthy were up-to-date dormitories are these:

One morning James Russell stood, hat in hand, to assist absent-minded Dr. Peabody (whose sight was not so good as it used to be) to alight from the old horse-car in Harvard Square; the ever-humane doctor, seeing the inverted hat, dropped therein a coin, with a "There, my good man, there!" Lowell ever after cherished the coin as a memento.

The Autocrat of the Breakfast Table was once a guest—and a very approachable one—at the Profile House, in the White Mountains. One evening charades were in order; and Holmes asked permission to put one on. This was joyfully agreed to; whereupon he had a brief consultation with a friend. The latter then appeared, as if for a morning stroll, and rambled aimlessly upon the stage; then Holmes followed, walking briskly; the two gentlemen met, saluted cordially, and then left the stage. "A word of five syllables in that one act," announced Holmes. Nobody could guess the word, which was "met-a-physician."

The appreciation of this charade was so cordial that Holmes was asked to give another. He and his fellow-conspirator complied; to everybody's mystification they went through precisely the same scene. "A word of three syllables in that one act," announced Holmes this time; the word was "metaphor." Uncle Dan tells how, when Holmes was just a struggling young doctor somewhere along Charles Street, he once threatened to put out a sign, "Small fevers gratefully received."

We may add here the experience of James Payn, at one time editor of the *Cornhill Magazine*, the door of whose sanctum was one day opened by an unan-

nounced caller. The latter had a goodly roll of papers under his arm, whereby Payn scented a poet with a never-ending epic. "Well, sir?" "I've brought you something about sarcoma and carcinoma," announced the caller. "We are overcrowded with poetry—couldn't accept another line, not even if it were by Milton." "Poetry!" flashed the caller indignantly; "do you know anything about sarcoma and carcinoma?" "Italian lovers, weren't they?" ventured Payn. The caller retreated in the greatest wrath; under the same roof as the *Cornhill* was the office of a medical and surgical journal, and that it was had been sought by the medical writer of the treatise on those lesions with the euphonious names.

PULICIDE

Some may imagine it to be an easy thing to kill a flea; such delusion will be dispelled by the following statements, which are authoritative, being based on a report on *Flea Destruction* of the United States Public Health and Marine Hospital Service. It should be premised, however, that the investigation noted, though thoroughly scientific, was limited in scope; for only the *Pulex irritans*, the *Hoplopsyllus anomalus* and the *Ceratophyllus acutus*, with two other varieties were examined; and, as every one knows, this is but touching the fringe of the flea question.

Pretty much every insect can be destroyed by corroding it with chemicals, or by suffocating it outright, or by euthenizing it with ether or chloroform or laughing gas. Not so, however, the festive flea, which will survive all these modes of execution combined, with others added. It will survive the agency which kills its "host," such as the rat or the squirrel; and (with

its marvelous power of jumping across infinite distances) will find a new boarding place in another hospitable and as yet unvivified pelt. Besides, when can one say that pulicide is a deed accomplished? A flea that has not moved for half an hour has been pronounced dead; yet the abandoned creature has afterward sprung up as ready as ever for the part allotted it in the cosmic scheme by a hopelessly inscrutable Providence. Again, what were the conditions of the flea before the attempted vivisection? Was it moribund, or was it physically up to par? It has been calculated that, size for size and weight for weight, if a man's jump had as much power behind it as a healthy, robust flea's, he (the man) could easily, from the street, clear the golden ball topping the flagstaff of the Woolworth building. So, for the conditions of the experiment, it should be known beforehand if the creature has its jump in normal working order. Again, climatic conditions must be considered; the flea will hop and bite with energy in dry, crisp weather; on a soggy day he may not care to do these things, and so may only seem to be dead.

It is almost impossible to drown fleas by dropping them into water; but soap and water will do for any flea. Thus is the flea the hobo among insects; for dipped in tincture of green soap he is dead beyond peradventure in two minutes, and no flea of the five kinds indicated could live after being soaped. Another evidence (among so many) of the disreputable character of the flea is that when soaked in absolute alcohol, he may become paralyzed; but he will certainly recover, and (as in the old song) when one puts his finger on him, behold he is not there. The strongest whiskies are only fifty per cent. alcohol; and there is surely no record of any

human survivor who has been submerged in whisky; yet fleas come out seemingly all the better for it, after being soaked in absolute alcohol (98 per cent.). Again, a flea left to swim in formalin (a very powerful insecticide) was "apparently dead in twelve hours," but "revived." It took 100 per cent. phenol more than one minute to kill a flea, etc. The conclusion is that water is of little value in flea destruction; glycerine is practically inert; alcohol is practically inefficient; kerosene and miscible oil are efficient; formalin, phenol, mercuric chloride and trekesol in the strength used as disinfectants are of little value, and powdered sulphur of none; the fumigants, bisulphide of carbon, hydrocyanic acid gas, and sulphur dioxide are "highly efficient in the strength employed for flea destruction."

It would seem, on the whole, that the surest way to kill a flea (and be able to testify under oath that he is really defunct) would be to place him on one of those impenetrable plates used in naval warfare, and confine him thereon by means of cables fastened securely to each of his several legs; then to train upon him (from as near a distance as would be feasible) an irresistible projectile from one of those twelve-inch guns. If the flea should not (by reason of the phenomenal spring mentioned) break away and get out of range, it might fairly be assumed that its destruction beyond resurrection had been consummated; that is, considering the unerring aim for which the American navy is so justly famous: if the experiment were tried in the Cuban or the Patagonian navy, one would be rash to guarantee the result.

UNSCIENTIFIC FUTILITIES

True science is perforce both sane and utilitarian; and her votaries have ever definite objects in view, which they seek by reasonable and practical means. There have been instances of doings assumed to be scientific that would hardly fill these specifications, but which have a jocund interest and may besides possibly have instructive point.

An illustrious nature lover (and not a nature fakir by any means) becoming interested in the question "Why does a mosquito refuse to touch a frog?" and perhaps with an ultimate view to the elimination of both these pests, rightly concluded no fair answer could be given the question until it was determined if the mosquito does really make this blessed exception. So the experimenter repaired after nightfall to a marsh, where he held up a frog in the presence of the mosquito host. His hand was most grievously bitten, while the frog had never the slightest occasion to scratch himself. One is here reminded of the Hibernian gentleman who held his dog all night in the snow to freeze it. It appears never to have occurred to our nature lover to have saved himself those dreadful stings by wearing a glove stout enough to be impermeable even to mosquitoes. Nor for all his pains did he prove anything worth while. For whether mosquitoes sting frogs or no, the two genera have from time immemorial been known to flourish in the same sort of place. There seems to be an amicable relationship, a sort of business understanding between them, the mutual object being the vexation of humankind. True, frogs are supposed to eat mosquitoes; but this seems to be done genially and without heat, after the fashion of the companionable walrus

in "Alice in Wonderland," who after dancing with the oysters, tearfully devoured them. And yet the alleged proclivity on the part of frogs, to eat mosquitoes, seems not to have diminished the visible and working supply of the latter. Their joint presence in marshes has been so detrimental to nocturnal comfort and to the value of nearby real estate that something ought certainly be done—something rational, however. These creatures are both musically inclined and presumably they enjoy each other's songs—a penchant not generally shared by their human neighbors; and yet after some persons we have heard sing, we should rather, if we had to make a choice, decide not unfavorably to the marsh denizens. Be all this as it may, the only rational purpose of any experimentation in the premises would be the elimination of the mosquito and the frog; and there is no other way to achieve this than to drain the marshes.

Another "scientific gent," a resident of the cactus belt, was some time ago (possibly still is) zealous for the formation of a cult of cactus eaters. The spineless cactus of lower California has been his favorite food; he has been eating it, drinking concoctions of it, taking it in soup and omelette and salad; and he gained weight in the fortnight when he lived exclusively on cactus. Nevertheless he has, no doubt, long before this, found the habit an absurdly expensive one; and any cactus-eating cult, unless it be made up of millionaires, must inevitably die out for the monetary reason alone.

It was some time ago reported that a fellow-citizen has made a will consigning his body, after his death, to various mechanical uses. Buttons are to be made of his bones; leather bags of his skin; fiddlestrings of some of his more intimate internal relations. This

gentleman proclaimed himself a utilitarian, determined to practice his creed to the very death. Yet his philosophy is really not utilitarian. For the bone button market is now so well supplied, these articles sometimes get into places where they certainly have no business—into soup, for a horrible example. And there is no dearth of fiddlestrings—more's the pity. And what normal individual would care to buy and have about him bags made of human skin—and this in an era when felines and canines, whose pelts would make much better bags, are so prolific and can be had so reasonably as to expense. In point of fact, it would cost more to transfer the mortal remains of this pseudo-utilitarian into merchandise than the product would bring in the open market.

CUPID IN PSYCHOLOGY

Prof. G. Stanley Hall has devised a new and a scientific definition of love. Of course, there have been no end of definitions of this cosmos-pervading emotion, hundreds of which are recorded in any one of those gilt-edged volumes with flowers on the cover and a silk painted or embroidered book mark worked into the binding—a volume for which any right-minded man under thirty would gladly pay three dollars and feel he had made the best investment of his life (except of course the one he might find in that path lighted up by that book). But the definition we are about to submit to the eager reader is “different.” We might observe that it has a Hall-mark peculiarly its own, and that it is not likely to find its way into future treatises on poesy. It is a six-ply definition, as follows: Love is “emotive delusion, fixed idea, rudimentary paranoia, psychic neurasthenia, episodic symptoms of hereditary,

degeneracy, and psychic emotive obsession. We shall leave it to the reader to make out what Dr. Hall has been driving at, selecting for comment only the phrase "rudimentary paranoia." Here seems to us an entrancing phrase, which might be very agreeable to femininity when rendered 'neath the summer moon, softly and mellifluously, as in a song to one's own accompaniment—that is, if one is quite positive he knows how to sing. And yet some might hold that "rudimentary paranoia" sounds blood thirsty. Well, we confess this the more inclines us toward it; we are taken with its primitive, elemental verve. And we might just as well express here our impatience with present-day methods of love-making. It irks us to think of young men constantly on their knees (he who begins there will always stay there), fooling away the time that should be used in doing the World's Work, whilst the maiden backs and fills, as: "I will and I won't; maybe and yet I am not sure; this is so sudden; I will be a sister to you until we know each other better; and, father will miss me so; and, how can I live without mother;" and so on. Much preferable the good old primeval plan when one, having developed a healthy, robust rudimentary paranoia, selected a fairly sizeable club, sought out the object of his adoration, fetched her a whack on the head (nothing brutal, of course, but just sufficient to the end in view), and carried off to his abode her unresisting form. Depend upon it, homes were happy in those days; with no talk of divorces or suffragism or feminism or such like folderols.

SOCIAL EXCITEMENTS

Something like a decade ago a Washington news-

paper correspondent wrote of a Congress of the Daughters of the American Revolution and its disorderly meetings: "It is the unanimous opinion of those who have attended the Congress that, while the Daughters of the American Revolution, individually, are nearly all intelligent, refined and attractive women, collectively they are an uncontrollable mob." These identical words would have been re-applicable to the Twentieth Continental Congress, held in April last, of these same Daughters of the American Revolution. Again all sorts of heinous accusations were made; not once, but frequently, was "a rumpus started"; the Madame President was, with approbrious intent, stigmatized by a member of the opposing faction as a "czar," an absolute and relentless despot being no doubt implied in this term. This same Madame President was alleged to have committed the heinous crime of changing her mind—a phenomenon which has from the very beginning of the race been agreed to be not at all a criminal proceeding, but rather a most indubitable right and privilege of the feminine nature. All sorts of disagreeable asseverations and unpleasant insinuations were made. The Revolution was thus, for at least the twentieth time, fought all over again; only the British had no hand in the business. The fighting was all done in the American camp, where all the casualties occurred.

Now, every reader will surely agree, and that without qualification, with the Washington correspondent we have quoted, as to the charm, the amiability, the sense of justice and the gentlewomanliness of each and every one among those Revolutionary Daughters. By what occult processes, then, is the normal individual, on becoming a member of an assemblage, likely to

take leave of his or her natural temperament and characteristics; by what means is the human unit, immediately it becomes merged in a crowd (meaning by the term a collection of people) moved to do and say things that would not be thought of in the individual capacity. These psychic factors are mainly suggestion and the force of inordinate social excitement; under their influence the individual loses the power of calm observation, of logical thought; for the time being he is no longer "king of all that is under his own hat;" his highest and last developed cerebral functions (reason and judgment) are for the time being inhibited, and "out of the circuit." (These phenomena apply equally to males; so let us now write our observations as of the masculine term, since "man embraces woman.")

The individual in the crowd, then, has for the time being, undergone reversion; he assimilates with unusual readiness the ideas of others, however unreasonable they may be; and he proceeds in accord with those with whom he has associated himself, however unreasonable or unfair their proceedings may be.

Suggestion is "the insinuation of a belief or impulse into the mind of the subject by any means, as by words or gestures, usually by emphatic declaration." The art in suggestion lies in the ability to present an idea in such a persuasive, convincing and apparently probable light as to command the assent of the subject. The process is precisely represented in the everyday expression: "What made you put that idea in his head." The essential difference between suggestion and hypnotism is that in the latter the subject arranges beforehand to submit to hypnotism. He is generally fully aware that he is about to undergo the process. Suggestions are oftener than not implanted in the sub-

ject's mind when he is unaware of the transference; the act of reception may be—generally is—involuntary; in suggestion the subconscious mind may receive an idea to which the conscious mentality may be oblivious.

As simple an instance as may be of the influence of suggestion is found in the act of yawning. Anyone can test this by yawning in a street car; the people in the seats opposite who see the yawn will presently yawn themselves.

Anyone who wants fully to comprehend the force of inordinate social excitements should read the work of Gustave Le Bon, entitled *The Crowd; a Study of the Popular Mind*. To this profound thinker a crowd (be it a jury, a society, a legislative assembly or a congress of ladies such as we have instanced to begin with) is an entity not at all analogous in its psychism to that of the individual units which compose it. A crowd (in the sense here employed) cannot be depended upon to reach conclusions by the same processes that the self-poised, judicious, single reasoner employs. With the crowd the emotions hold full sway; and reason and intellect are set aside. "The mental quality of the individual in the crowd is without importance; from the moment they are in the crowd the ignorant and the learned (and let us add also the gracious and the kindly) are equally incapable of observation"—and are in danger of losing temporarily the lovelier feminine qualities. And be it finally emphasized that what a crowd will do is a very different thing, in all likelihood, from what each of the individuals in it would do if alone; and that generally the crowd's standards of conduct are likely to be lower than those of its component elements.

PSYCHIC RESEARCH

Such subjects as apparitions, psychism, spiritualism and the like have been so much exploited by charlatans and pseudo-scientists, with interests so obviously personal and selfish, that reasonable men, honestly desirous of ascertaining the truth, have generally abandoned this field. Professor Hyslop, however, is an honest, earnest searcher for the truth, and his latest book, "Enigmas of Psychical Research,"* is entitled to scientific consideration, even though this must be quite adverse to his position. He accuses scientific men, especially "physical" or "materialistic" scientists, of purposely and even maliciously ignoring the work of those engaged in psychic research, of a very culpable indifference to supernormal or metaphysical phenomena. "Science," he declares, "having become accustomed to residual facts within its own domain, is loath to admit the existence of facts which limit that domain or demand the acceptance of a larger than the ordinary material world." Let us inquire how just are these accusations:

Charles Darwin some thirty years ago, when spirits were rather rife in England, was invited to inquire into their nature and habits. Though skeptical, he respectfully and attentively considered the subject and got Huxley to help him. The latter visited a seance held in a private house and reported to Darwin that "the performance was so gross an imposture as ever came under my notice." Professor Darwin, who was also present, declared: "Unless I had seen it I could not have believed in the evidence of any one with such perfect good faith as Mr. Y. (the host) being so worthless. It has given me a lesson with respect to the worthless-

*Boston; Herbert B. Turner & Co.

ness of evidence which I shall always remember, and, besides, will make me very diffident in trusting myself." Charles Darwin concluded concerning the medium on this occasion who "had the highest credentials": "To my mind, an enormous weight of evidence would be requisite to make one believe in anything beyond mere trickery"; and again: "The Lord have mercy on us all if we have to believe in such rubbish." Tyndall, who investigated "spirits" exhaustively, has described his many difficulties in conducting a thoroughly scientific investigation in the presence of believers or, shall we say, gullible people. He could not persuade them to employ such ordinary precautions as are essential to investigate these phenomena; and he clearly demonstrated their fraudulent character. Prof. Simon Newcomb, who was perfectly willing to oblige the spiritists and to study the phenomena which interested them, has left in his "Reminiscences" diverting accounts of how he found it impossible to continue on the farcical lines laid down by them. Faraday, at the cost of much time and trouble, convinced all who were open to conviction that fraud and self-deception were at the bottom of most of the spiritist doings with which he came in contact. He was shocked at "the superstitions which in this day of boasted progress are a disgrace to the age and which afford astonishing proofs of the vast flood of ignorance overflowing and desolating the highest places."

If these great names do not suffice Professor Hyslop we would add that Podmore, who was president of the Psychic Research Society, demonstrated in his book, "Studies in Psychic Research," the preposterous and flimsy basis for most of the "established facts" on which spiritism was founded. This book, by the way,

is a splended exposition of the laws of evidence which should obtain in any investigation, and is well worth the perusal of both physicians and lawyers. Jastrow, in his "Fact and Fable in Psychology," submits some very illuminating data. Balfour, the recent British premier, as the result of an exhaustive study of psychic phenomena, has become the most conspicuous modern example of the "philosophic doubter." Among the great men in science who have taken up this subject was Wallace, who has been characterized as a "willing believer"; this should not surprise any one who has noted how "easy" Wallace was in the hands of the anti-vaccinationists.

Professor Hyslop does not help his position by such characterizations as "physical" or "materialistic" scientists. Herbert Spencer, the great formulator of the doctrine of evolution, was justly impatient of those who held that doctrine to be purely materialistic. His "First Principles" begin with an earnest and reverent consideration of the immaterial "unknowable," whence is derived so much of the knowable as finite human wisdom can by patience and reason come to understand. Science is knowing; and the real scientist is eager only for the truth, no matter where he may find it or whither it may lead him. Each worker gathers what he can within his own ken, insisting only that his facts shall be true and absolutely incontrovertible; and all which he gathers together he gladly adds to the sum of all science or knowing, which is philosophy, in the hope that his gleaming may redound to the welfare and happiness of his kind.

FACTORS OF SAFETY

"The half of his strength he put not forth." In

most great men we discern a conserved energy far beyond the measure of their deeds. All men and women have a latent potency; the resources of mind and body they are able to draw on for supreme occasions are far beyond any idea they have had of their capabilities. When that profound though untutored psychologist Napoleon had got his exhausted army nearly to the Alpine summits, and when not another step seemed possible, he called a halt for a brief space; and then, giving a band a picturesque position, he had "The Marseillaise" played. The strains reverberating over the snows and echoing from the crags moved his men magnificently across the peaks, by means of the strength they had but knew not of. The mortality from wounds in a defeated army far exceeds that in the army which has triumphed over it. In a recent Harvard-Yale boat race, it was not the winners, but the Yale crew, that were painfully spent at the end, though you would have thought Harvard would be the more exhausted; since she had to make the greater effort to win. It was the same in the Cambridge-Oxford match a year ago. The reason for all this lies largely in that the reserve forces in our physical makeup—upon which our mental processes are conditioned—are wonderfully ample; wherefore we are able to preserve a fairly normal condition despite the many inimical agencies environing us—undue stresses and strains, accidents, the attacks of parasitic organisms, various diseases, and the like; and can, most of us, keep going fairly well, through to the normal span of human life. For many of our functions, the mechanisms are doubled and even trebled; the function of one organ is oftentimes assisted by other organs. Our tissues have a property peculiar only to living things—that of self-repair. Only recently it was

demonstrated in the Laennec Hospital in Paris that one may live with lungs reduced by operation to one-sixth their usual capacity; many a consumptive goes about with no more than that. From one-half to three-fourths the liver may be removed without jeopardy to life, hardly indeed to health. Many organs are bilateral; one really needs but half of them. One-half the brain would do—and has had to—after accidents or certain diseases. People have got along as if nothing had happened after the removal of a whole kidney. Dr. Samuel J. Meltzer, in a superb lecture on "The Factors of Safety in Animal Structure and Animal Economy," probably first showed in a scientific way how our bodies are provided with large margins of safety, over and above the maximum required by normal activity; how thus are promoted the integrity of life, the perpetuation of species, and the processes of natural selection. He borrowed the term from the mechanical engineer who, in unwitting imitation of nature, calculates that the engines, bridges, and other structures he builds should be capable of withstanding not only the stresses of reasonably expected maximum loads, but also those of six or seven times such loads.

KILLING AND CONSERVATION

In modern warfare the cost of killing one soldier averages \$15,000. In the Boer "row" this item came as high as \$40,000. The Balkan conflict with Turkey was conducted more economically; and yet \$10,000 was burned up in making one man food for powder—really a scandalously profitless business, considering that the outlay was a dead loss (nothing funny intended) except in fertilizer product. The most expensive thing in nature is the destruction of human life; the

proceeding would be outrageously costly for the world if not a dollar was sunk in it. At \$15,000 the head no one has any right to claim humankind to have more sense than the most dunderheaded creature in the cosmos. The Balkans have thrown a scare into Europe that is evaporating two billion dollars; for such is what the six great European powers composing the Triple Alliance and the Triple Entente are paying for military preparations—not for war, but to prepare for war. Add to this money waste the loss of production by two and a half million young men being withheld from the world's real work, for military and naval service; and the total cost (at the individual rate of \$400 annually) of the fighting forces of Europe would reach the three billion mark. All this is on the highly rational theory that the more crushing and blood-sweating the war taxes levied on the toiling masses, the less likelihood of international slaughter there will be! It makes one recall Heine's terribly grim and unholy apostrophe to the Almighty; "Oh, Thou magnificent Aristophanes of the universe, how your sides must shake with laughter whilst you look down upon us mortals and contemplate the epic idiocies of which we are capable." (Or words to that effect.) The paradox has been well put that the most precious thing in life is the cheapest (in dollars and cents), whilst the most useless thing is the dearest, in money. And what is there cheaper than life conservation—which is, by the way, the biggest idea the twentieth century has thus far evolved. Panama, for example, was a generation ago about the most pestiferous and gangrenous spot on the globe. Colonel Gorgas and his associates have turned that region into a veritable health resort; only two or three communities in these United States can to-day

get under the Canal Zone death rate; and the actual cost of this job has been \$2.48 the individual. The Rockefeller Commission for the Eradication of Hookworm Disease and its humane allies are curing many thousands of the people in our southland at something under seventy-eight cents the head. Which is the nobler achievement; such a life-saving one; or that other \$15,000 the man life-destroying proposition? Nowadays, on this side of the Pond at any rate, a great many people are seeing the point; for example, these citizens who are in the Life Insurance business. Actuaries are estimating that \$1,500,000,000 is a safe estimate of the economic value of lives that are lost needlessly each year in the United States alone, not through wars, but only through preventable sickness and accidents. The idea of health conservation was Professor Irving Fisher's of Yale. He several years ago outlined a plan for the education of the public to the end that Federal, State and municipal authorities might provide improved health protection; and he suggested that life insurance companies, purely in the way of business, and of "enlightened selfishness," could well afford to contribute in money and brains to such a campaign. Well, the Association of Life Insurance Presidents, representing policy holders all over the world (some twenty millions in the United States alone) are working the suggestion for all it is worth. They are educating their clients, and urging them by every means in their power, for personal and communal hygiene and for disease prevention. And the movement is permeating every phase of our civilization.

THE ETHICS OF INFECTION

A hitherto unknown race of men—"white Eskimos"

—has been discovered by Dr. Vilhjalmur Stefansson in the Coronation Gulf territory of Victoria Land, British Columbia. Several fanciful theories of their origin have been offered; Dr. Stefansson's own theory is that this new race consists of descendants of a Norse colony in Greenland, supposed to have been totally destroyed by hostile Eskimos long ago. A remnant, according to Dr. Stefansson's hypothesis, escaped westward and mingled with the Eskimos of Victoria Land. The characteristics of the new race differ from those of any hitherto known people of the Arctic regions and the occasional appearance among them of blue eyes and light hair renders the theory of Scandinavian descent probable. The moral status of the new race is said to be high.

According to newspaper report Dr. Stefansson says: "Whenever a new people is discovered, commercial interests want to know if any money is to be made and what are the mining and fur-trading possibilities. A few people want to know what the prospects are for saving souls. Nobody seems to take any thought about saving bodies." Missionaries, actuated of course by the loftiest motives, with much sacrifice, will bring the new people knowledge of religion; and traders of all sorts, with motives not so conspicuously altruistic, will bring them gunpowder and alcohol, and both missionaries and traders will bring them new and deadly infections. If history repeats itself, the result will very likely be the extinction of this really fine people by disease and alcoholism, aided perhaps by famine following on the extermination of the caribou by firearms. The history of exploration and conquest is full of parallel instances.

John Guille Millais,[†] the son of the great painter,

[†]Millais, J. G.: Newfoundland and its Untrodden Way.

says of the Newfoundland Micmacs, that "consumption and the traders' rum are playing havoc with this fine race." Dr. Grenfell has observed that epidemic diseases have up to recent years been practically unknown along the Labrador coast. The infections which the natives have contracted have been introduced mostly from regions to the south. One little Labrador settlement was for the first time visited by typhoid fever; Grenfell, when he arrived on his healing mission, found eighty frozen bodies of those who had speedily and most miserably succumbed to it. Tuberculosis, diphtheria and the exanthems are much more fatal among the Labradorians than among us.

Dana wrote in 1835†: "It has been said that the greatest curse to each of the South Sea Islands was the first man who discovered it; and every one who knows anything about the history of our commerce in those parts knows how much truth there is in this; and that the white men, with their vices, have brought in diseases before unknown to the islanders, which are now sweeping off the native population of the Sandwich Islands at the rate of one-fortieth of the entire population annually. The curse of a people calling themselves Christians seems to follow them everywhere."

Measles is an exanthem comparatively innocuous in civilization, but deadly to primitive peoples unaccustomed to it. Dr. Stefansson says that it has killed 50 per cent. of the Eskimos in Canada and Alaska in the last fifty years. It was entirely unknown in the Fiji Islands until introduced by whites in 1875. Thereupon in a single epidemic 40,000 of 150,000 Fijians, men, women and children, the aged and the young alike, died

†Dana, R. H., Jr.: *Two Years Before the Mast*.

most pitifully of measles. How often, since the Spaniards following Columbus came in touch with the Caribbeans (whose name alone is left) has benevolent assimilation spelled pitiless extermination! The negro in his native Ethiopia knew nothing of consumption, syphilis, alcoholism or cocaineism until his white brother came to bestow on him the blessings of civilization. Now tuberculosis is proving fatal to large numbers of the negro race in these United States. The same dreary story obtains regarding the American Indian whenever and wherever our people have come among them, with our tubercle bacillus and our fire-water; for the Indian is dying of tuberculosis in greater numbers than the negro and in far greater numbers than the whites.

Thus racial susceptibility to bacterial disease should give pause to those who contemplate the "regeneration" of peoples too gratuitously assumed to be barbarian and inferior, and whose departures from civilized standards are conditioned largely by environment. The "perpetual quarantine" urged by Dr. Stefansson for the white Eskimos seems reasonable and humane. He says: "The only really intelligent management of the Eskimo in the world is in Greenland. Here Denmark has a perpetual quarantine, and as a result the population is on the increase. Nobody is allowed to land in Greenland unless he is thoroughly inspected. Such an arrangement is perfectly feasible for the protection of the Coronation Gulf Eskimos."

CONSUMPTION AND CIVILIZATION

The tubercle bacillus is an index by inversion of the real progress of the race. By it the claim of civilization to dominate human life may fairly be judged. Tuberculosis will decrease with the substantial advance

of civilization, and this disease will as surely increase as civilization retrogrades. Is this statement much too broad? Is it untenable? Consider, then:

There is no phase of life which tuberculosis does not touch—nay, upon which it does not press with a most grievous, heavy hand. It claims, between infancy and old age, every seventh, and between adolescence and maturity every third or fourth, life—in some of our communities every other life. Every other adult negro succumbs to it.

Society's "submerged strata," which cannot free themselves from the grip of pestilent environment—the darkness, wretchedness, and starvation upon which the saprophytic bacillus propagates its teeming billions—yield victims far in excess of those claimed by all other infections put together.

Nor are the rich, in fancied security, any freer from the danger than were the gallants and the gentle ladies in Poe's dreadful tale, who thought by isolating themselves to escape the Black Death. For the beautiful laces and garments worn by the well-to-do and the pretty things worn by their children, and often got at remarkably low prices (for is he not a fool who does not buy a thing as cheaply as he can?) are like as not worked at and bent over and coughed upon from dawn until midnight by sweat-shop consumptives. Thus much oftener than we imagine does the poverty of Lazarus make itself felt in the house of Dives.

There is scarcely a trade, or occupation, or business, or calling which does not, in varying degree, give up its quota of valuable lives. And the factory is even more productive of tuberculosis than the home for the consumptive workman, under conditions which have up

to recently prevailed, has infected his fellow-workman more than he has the members of his own family.

In literature and the arts how many precious lives have succumbed to this veritable captain of the men of death. Consumption has ever been "death's direct door to most hard students, divines, physicians, philosophers, deep lovers, zealots in religion." Who can estimate the loss in beauty, poesy, in intellectual treasures, and in all the sweetneses and refinements of life, which this disease has inflicted upon us? How many an inspired genius, even before his powers have matured, has suffered its most untimely visitation!

The proverb goes, "*Trokner Husten-Toder Trompeter*"; nor has the sword ever been nearly as voracious of human life as has been the tubercle bacillus. And such scourges as cholera, the plague, small-pox, although they have been more gruesomely picturesque in their ravages, have never been in the running with consumption.

An intensely practical spirit has come to be representative of our present-day civilization, and of this we are exceedingly vain. In the popular phrase, everything is centered in the question: "Does it pay?" and whatever fails to come up to the price of money standard is eschewed contemptuously. To understand adequately this tendency one has but to contemplate, for so long as he can endure to look upon it, the characterization of Mammon which Mr. Watts has painted. It is, then, nothing short of astounding—the economic losses which we permit tuberculosis to inflict upon us; astounding how our shrewdness, our business prescience, has in truth a vision extending no farther than the essentially obtuse angle the apex of which is the end of its nose.

Tuberculosis is a disease entirely preventable—and by means extraordinarily simple, and of comparatively little cost. Yet, to state a single fact, it is costing the United States an annual loss exceeding a billion of dollars. Thus, then, does this disease affect most intimately every relation in life, every aspect of civilization—the infant subsisting on impure milk; the child studying in unhygienic schools; the adolescent contending with the conditions peculiar to those years; young men and young women aspiring to matrimony; the mother, in whom lies the destinies of the races; the man who should be sturdily accomplishing the world's work. Tuberculosis is pervasively concerned with our habits and customs, with our housing conditions, the sanitation of our cities, the regulation of child labor, and innumerable other details of existence. It has to do fundamentally with human evolution; with human heredity, its preservation, its course in the present life, its generations to come. It provides a subject much more worthy wise and sane legislative consideration "than all the many questions that make and unmake Ministries." From whatsoever point one views this all-permeating matter, one must conclude that tuberculosis is indeed the prime executioner fulfilling the law of the survival of the fittest.

AN ANTIVIVISECTION PLAY, IN THREE ACTS

The scene of the first act is laid in Carnegie Lyceum, in New York City, where there was recently an enthusiastic gathering. Dinners, of which roasted or broiled meats (animals, by the way, almost invariably meet tragic deaths) were a part, were being comfortably digested; so that everybody was in a position to take

an amiable interest in the proceedings. The great majority in this audience were women, who wore the plumes of slaughtered birds in their hats; and (it being evening) pet dogs, whose tails had been docked, and whose ears had been clipped, were reposing undisturbed at home. The lady president of the Antivivisection Society (in alliance with the International Antivaccination Union) spoke with the precision of statement so characteristic of the feminine mind. The great difficulty in getting started in this country, she declared, is because, "while no doubt 50 per cent. of the medical profession are to-day at heart opposed to vivisection, its leaders in New York, confident in their eminence and power to punish, have sent out a practical prohibition to all physicians that they should not approve or sustain in any manner any movement toward a restriction of vivisection." Several public-spirited gentlemen were on the platform. One among these, in terms conspicuous for man-like temperance of expression, stated that those medical experimenters who vivisected animals were "virtuosos of agony, in whom curiosity, vanity or scientific zeal has supplanted humanity, and to whom harmonies or discords of agony or long-drawn cadences of torture, struck from quivering nerves are music." One clergyman contended that the practices condemned are continued for "the purposes of commercialism, to obtain antitoxins, which have not yet proved their efficacy, and in some instances have been known to have increased disease instead of decreasing it." Another maintained that vivisection is "contrary primarily to the law of God;" this clergyman would no doubt a generation ago have denounced the administration of chloroform to women in labor, on the basis of some scriptural expression. The Rockefeller Institute was

especially stigmatized and "resoluted" against as being "the principal theater of vivisection operations in this part of the world to-day." A bill was read, which had been introduced in the legislature at Albany; and the assemblyman who was responsible for it naively observed that in passing it the state would incur no expense, for the Antivivisection Society and the Humane Society had offered to provide the salaries of the inspectors proposed in the bill.

The second act of this play takes place in the city of New Brunswick, N. J., where the two villains of the cast, by name Dr. H. H. Janeway and Dr. E. I. Cronk, have been laboring under the obsession that without animal experimentation medicine would be "but a savage art—not even the shadow of the present science of cure and prevention." Being desirous of perfecting an operative procedure for gastric cancer and tuberculosis, they have done tentative operations on animals; and have also, in a spirit equally unscientific and calloused, removed a lobe of one lung from a dog named Pete. The sufferings which a voracious lady of that city had alleged this dog was enduring have divided that generally peaceful and sane community into two camps. A somewhat Gilbertian warfare has resulted; most of the contestants, especially the feminine participants, "did not know what it was all about anyway." A superb strategic move was the arrest of Drs. Janeway and Cronk on charges of cruel usage of the dog Pete, made by the aforesaid tender-hearted lady; the miscreants happily regained freedom when bail of \$300 for each was paid. Pete, because of whose agonies the arrests were made, was sought for in his usual comfortable bunk in Dr. Janeway's barn. But the martyr, who "for the sake of science, had given most of him-

self away," was absent; he (or what remained of him) was found near by, engaged, with all his old-time zeal, in his favorite occupation of chasing the New Brunswick cat; which he, in his turn, was trying to vivisect.

The third act takes place on a bleak bank of the East River, with the reprehended Rockefeller Institute providing the back scene. Several hours before dawn a venerable gentleman rang the bell at the entrance door of the building. But there was no one to respond to his ringing. He therefore sat down before the doorstep, or waited about it in most inclement weather, until daylight. Being then admitted, he made known his errand. He is connected with Berea College, where either a real or suspected case of epidemic cerebro-spinal meningitis has developed; and he was most anxious to secure some of the serum which Dr. Flexner and his associates have, largely through animal experimentation, evolved both for curative and prophylactic purposes, against that dreadful disease. At first it was thought to refuse his request, for the reason that the work on this serum is still in the experimental stage. Finally, however, on his assurance that it would be given only by skilled physicians, who would be responsible for its proper use, several vials of this serum were entrusted to him; and they were at once rushed off to Kentucky, in the hope that they would reach their destination within twenty-four hours. All men and women of really humanitarian instincts may reasonably entertain the belief that in this circumstance valuable human lives have thus been saved, and that much of the ghastliest sufferings in all medical experience has thus been averted.

The reader must decide for himself if this play has been a farce, a comedy, a drama or a tragedy.

MONGRELIZED RACES

Dr. Eliot, of Harvard, spoke recently of the changes immigration has wrought in the industrials, family life, and civilization generally of Massachusetts; he fears a great political evil in the lack of homogeneity now obtaining in that population. Not in a century may it become homogeneous if ever at all.

In his youth his community was homogeneous. His father's servants, the men who worked the farm, the mechanics and all the servants at Harvard, were Americans, descended from pilgrim stock—all except a decent Irishman who worked about Cambridge. Marvelous; only one Celt to a whole American community. *Tempora mutantur*. The puzzle to-day would be to find a single puritan in a Hibernized (though far from hibernating) community. Dr. Eliot emphasized that there was in his boyhood but one racial element and seems to deplore our present-day mixture. Yet we may, like honest Touchstone, thank the gods for our race mixtures, trusting that homogeneity may come hereafter. The point to emphasize is that those superb puritans of Dr. Eliot's youth were themselves not at all pure—that is, ethnically. There has never been since Homer, nor probably many thousands of years before the blind bard, a pure race; and providential it is that this has been so.

The English who supplanted the aboriginal Indians were by no means a pure type; nor were the Dutch themselves in all probability not a pure race, nor the French nor the Spaniards. Take the Frenchman of to-day. In the North are the descendants of the Belgae, the Walloons and other Kymri; in the East those of Germans and Burgundians; in the West Normans; in

the centre Celts, who at the same epoch when their name took its origin consisted of foreigners of various ancestry and of the aborigines; in the South were ancient Aquitanians and Basques: without mentioning a host of settlers like the Saracens; the Tectasages, who have kept at Toulouse the custom of cranial deformities; and the traders who passed through the Phocæan town of Marseilles.

Professor Boas, of Columbia, has found that when the ratio of race intermingling is as one to nine, there will be among the more numerous population only 18 to 1,000 in the fourth generation that will be of pure blood; and where two types intermarry with equal freedom, less than one person in 10,000 in the fourth generation will be of pure descent; that is, within a century the process of intermixture in this nation should be complete—homogeneity achieved!

A mixed race become homogeneous is as nearly perfect as a human race can be; and the more elements that enter the mixture the nearer will the ideal be approached. Is the reader not convinced? Look, then, on one of the recent pictorial pages of the *Sunday Times*. One sees here the photographs of the adorable "snow baby," taken during her first summer in Greenland; and so through the various eras of her existence to the culminating portrait of Miss Marie Ahnighito Peary. Here is a triumph of natural eugenics that has delighted the eye of every young fellow—and of certainly one old fellow—that has had the good fortune to contemplate it. At least four races have been the blessed heredity of this most winsome gentlewoman; for her father, Admiral Peary, is of English and French descent; and her mother is of German and Russian forbears.

SPUGS AND SPEFS

It is a fine thing to be a spug—a member of the Society for the Prevention of Useless Giving; this is an excellently purposed and was recently a very active institution. Why not organize now a spef and begin without delay a membership canvass. The spef will not have so many calls for action made upon him; but for all that he need not necessarily be a dead one. He certainly will have for his consideration either a grave subject or a burning question, according to the position he takes. The wily writer, having now worked the principle of suspense for all it is worth, explains spef to mean a Society for the Prevention of Exorbitant Funerals. At first it occurred to propose spuf, a Society for the Prevention of Useless Funerals. But then not all funerals are useless—some are, on the contrary, very well worth while. Instances in point will spring at once to mind; for every reader has his own little list. One of the first things to come up for the society's consideration would be, which is preferable, burial or cremation? Both are not necessary, although a Chicago lady, whose husband died in New York, is reported to have deemed them so; for when the undertaker (this joke is at least as old as Chicago) telegraphed her whether he should cremate or bury, she instantly wired back, "cremate and bury, take no chances."

But very seriously, the enormous amounts which many among the poor pay for the funerals of their dead, have become a grievous matter. In a most pathetically squalid tenement apartment one will see an expensive coffin, many flowers, elaborate funeral furnishings, an all too ostentatious array of carriages, the neighbor-

hood crowding about and peering from the windows of many houses, and oftentimes a band of musicians heading the mourning procession to an expensive plot. Here is, indeed, a situation almost grotesque and Hogarthian, and certainly demanding reformation. In this relation one may well contrast burial with cremation. The latter need offend no religious sense, may indeed tend to a loftier religious exaltation; many of the clergy have spoken in favor of it. Were it not indeed the nobler conception—that of the spirit of the dead arising to the heavens out of the ashes of the body, than that the latter should remain to decay in ways most repugnant to the imagination. And is not cremation more than burial in consonance with the beautiful Pauline sentiment we have all heard under circumstances the most solemn in human experience, that “there is a natural body and there is a spiritual body”? Nor is cremation any longer a method on trial; it is established in many places throughout civilization. The point here to be made, however, is demonstrated in the experience of the Cremation Society of England, which was founded in 1874; in the hope of interesting the poor (who there, as among us, oftentimes spend far more than a right proportion of their means on funerals) this society made its fee \$25—a sum several times cheaper than the cost of burial. However, this poetic manner of disposing of the beloved dead has thus far found favor in England least among the poor, and chiefly among the professional, the intellectual, and the well-to-do.

EUTHANASIA

Maeterlinck, in his book “Death,” declares that all our knowledge but helps us to die in greater pain than

the animal that knows nothing. As science progresses it but makes for a prolongation of the agony of death—the most dreadful and the sharpest peak of human pain and horror, at least for the witnesses. “All the doctors consider it their first duty to protract as long as possible even the most excruciating convulsions. Who has not, at a bedside, twenty times wished to throw himself at their feet and implore them to show mercy.” The prejudice against the arbitrary induction of a painless and premature death will one day, believes the Belgian Shakespeare, be regarded as barbarian, as a “relic of the times when humanity was convinced that any known torture was preferable to those awaiting us in the unknown”; and he predicts that a day will come when science will no longer hesitate to shorten our misfortunes. “When life, grown wiser, will depart silently to its hour, knowing that it has reached its term, even as it withdraws every evening while we sleep, knowing that its day’s task is done.”

One hesitates to reopen this question whether physicians should purposely hasten the deaths of sufferers from painful diseases, or of those patients who would seem beyond recovery, and had therefore best be dead—a question which physicians must ever answer by a decided negative. But the views of a man of Maeterlinck’s caliber cannot be slighted. And the wonderful skill and literary charm he evinces fascinate the reader, and give weight to opinions which might be ignored were they less beautifully and touchingly expressed. Yet, the author of “*Pelleas et Celisande*” is a mystic, a poet and a dreamer of exquisite dreams—such a one the like of whom the world is ever in need of, and perhaps never more so than to-day. On the other hand it is essential for science—certainly for medical sci-

ence—to deal ever with the hard facts of life; should science seek to evade its responsibilities in these premises, she would swiftly be brought to book—in the criminal courts, for example. For it is not given to science to appoint herself, upon her own initiative, an executioner of human beings. Among the hard facts which science has to face are the following (which have to be reiterated in every opening of the euthanasia discussion): Physicians can never be sure that their prognoses of a fatal issue are absolutely infallible. People that have suffered from seemingly irremediable cancer, or from chronic tubercuolosis, have attended the funerals of the doctors who have ministered to them in their “fatal” illnesses. To err in medical prognosis is human; only divinity can appoint unerringly the hour of death. Nor has the physician (nor any other mortal) any right to hasten a death upon his human assumption of its inevitableness. Again, what a weed-choked field of possibilities, criminal or otherwise, would be sown were such advocacy as this of Maeterlinck to prevail; were, for example, the physician overpersuaded by the specious pleas of heirs, or by the simulated pity of other individuals anxious to sever ties such as most of mankind find precious, to provide for the sufferer, before his appointed time “a gentle and easy death.”

These quotations from the writing of a most deserving Nobel prize winner “for literature” make “copy” interesting indeed; yet it is to be feared they do not accurately express the situation. Physicians are not hardened men; there are none, as a class, more sympathetic. The span of doctors’ lives averages shorter than in most other callings—and this probably because the sufferings of their fellow mortals take so much out of them. It is not essential to medical practice to

prolong any convulsions; and there would never be the slightest occasion for anyone, on bended knee, to implore the physician to alleviate sufferings. To relieve pain is a first principle in practice, and the physician is always justified in this course, in so far at least as the life of the patient will not be jeopardized by his ministrations. And the physician is ever eager to do this, if for no other reason than that there is hardly anything so killing as pain. As to the horror of death, this the spectators may have; but it is the rarest phenomenon for him who is about to die to "suffer" death. Immediately death impends, the end is almost invariably benignant and beautiful. What, indeed, is there in all the cosmos so composed and content as the face of the dead?

THE PHILOSOPHY OF PRAYER

Part of a recent sermon by a veritable man of God is thus reproduced: In studying the biography of any great man we are very likely to be impressed with the paucity of his deeds and sayings by comparison with the influence he has exerted upon his day and generation; we cannot, by a consideration of the former, reach any just estimate of that influence. In such study we eventually become impressed, not so much by what the great man in the given instance did, or what he said, but by what he was—his character. This is so of Washington, of Julius Cæsar, of Abraham Lincoln, of Richard Wagner, and many another. All men, great and small, do and say for the most part what their environment, what the conditions of their time, require of them; but if we are to discern the intrinsic secrets of the power they have wielded, we must study not so much their word and deeds, as their personal habits.

Jesus Christ preached and healed the sick with altogether peculiar power; but it is probable that His tremendous influence upon mankind since His advent has been mainly by reason of His character. And to understand this we must study His personal habits. Conspicuous among these was that of prayer. Again and again, being sought in the intervals of His benign ministrations, His disciples found Him in prayer. In all my own ministry I have experienced nothing so fatiguing as an afternoon spent in sick calls; I confess this leaves me utterly exhausted, and only in prayer can I find refreshment of body and soul thereafter. I cannot sufficiently extol medical men, who are with the sick all day long, every day, and half way into the night. I wonder how they can do so; I marvel how they can endure the strain! The Archbishop of Salisbury, in a talk with medical students, advised them by way of relaxation from their duties to cultivate poetry; I know a better pursuit than that; it is to cultivate the habit of prayer.

An episode of hospital service is here recalled. On the interne staff was a quiet young man who by reason of his religious tendencies was blithely nicknamed "Grandma." When a difficult case was to be seen some one would say: "Let's have grandma along; any way he can help some by chipping in a prayer." In due time grandma became a "House"; and late one night a woman was brought into his ward who must surely die, if not at once operated on. Grandma 'phoned at once to his Visiting in town, who returned answer that he could not come, and that his House must operate in his stead. The patient was speedily prepared, and, to reinforce the poor gaslight (electric lights had not yet been installed in that hospital), other internes

and helpers stood about holding lanterns. In such Rembrandtesque surroundings and with perhaps a dozen nurses as added spectators, all moved by the gravity of the case, Grandma, scalpel in hand, stood by the side of his patient, at the operating table. It was a most impressive moment when he closed his eyes, his head bowed and his lips moving. Thus encouraged and fortified, he got at once to work; with his hand from first to last so sure, his eye so keen, and his brain so clear, that he seemed quite transfigured. Thus did grandma do a piece of work that many a rising surgeon might have envied. And when the last stitch was done, and the patient carried to her ward, those fellow-internes saw a light—which possibly remained with them till they reached their own bedsides.

The indubitable trend of modern thought is monistic, the basic conception being of a cosmic oneness in which all phenomena, however diverse they may seem, are inter-related and inco-ordinated. It is from this viewpoint that we recall three papers, by the late Rev. Dr. W. R. Huntington, the late Moueure Conway, D.D., and Dr. Lyman Abbott on "The Nature of Prayer." The layman as to theology could not fail to have been impressed with an idea that suffused all these three papers by clergyman each of a different Christian denomination: that prayer is helpful to the individual not as to the granting of specific personal requests; not that the inherently benignant laws of nature would be disturbed in any personal behalf; but that prayer is helpful in bringing him who prays into comfortable, restful and solitary relations with that First Cause known to human kin as The Almighty, Jehovah, "the power not ourselves that makes for righteousness," and so on. (May we not presume here to interpret the

term righteousness as meaning rightness, orderliness, consistent inter-relation, universal oneness.) It cannot but gratify the humanitarian who is not a clergyman to observe this departure from the theology of other eras; it is gratifying especially to the medical scientist, by reason that this modern aspect of religious faith, as here expressed by eminent clergymen, is much in unison with scientific faith—faith in the constancy of the universe, in the invariability of its laws, and in that infinite and eternal energy which permeates the cosmos. One may indeed venture the hope that, of the age-long conflict between theology and science, which has oftentimes been so cruel, so insistent and so deadly, there remains to-day but a difference, not at all of ideas, but only of nomenclature. May it not be hoped that somewhere between those two camps, of metaphysics and of materialism, a single standard can be raised to which all devout may alike repair—the standard of the universality, the monism of all human experience. Could not, then, a philosophy of prayer comprehensible to all be evolved—from which could ensue a consistent therapeutics of prayer. Assuredly the human being needs help from without; for, though a coefficient in the working out of his own destiny he is, when unassisted, a pathetically helpless atom in the universal scheme. When such “world compellers” as Bismarck, Gladstone and Cromwell and the like have humbly acknowledged this need, surely lesser men may seek it as well as they, and without humiliation. Is it not that the various aspects of human nature—the physical, the intellectual, the volitional and the emotional—when they have been perturbed by the stresses of life, are brought by prayer back to their normal co-ordination and functioning; that the

individual in prayer gets his relations to his environment readjusted, and finds himself restored to harmony with the eternal verities. Such, we submit, would be a reasonable conception of prayer which might well be advised and taught both in the pulpit and the clinic.

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